



The diagram illustrates the MEMS MPW service flow. It shows a large array of chips with several individual designs highlighted: Design A, Design B, and Design n. A red arrow labeled 'YOUR Design' points to a specific chip. Below the array, 'Packaged samples' are shown as small green chips. The EUROPRACTICE IC SERVICE logo is prominently displayed on the right. The background features a blue and white abstract design with circular motifs.

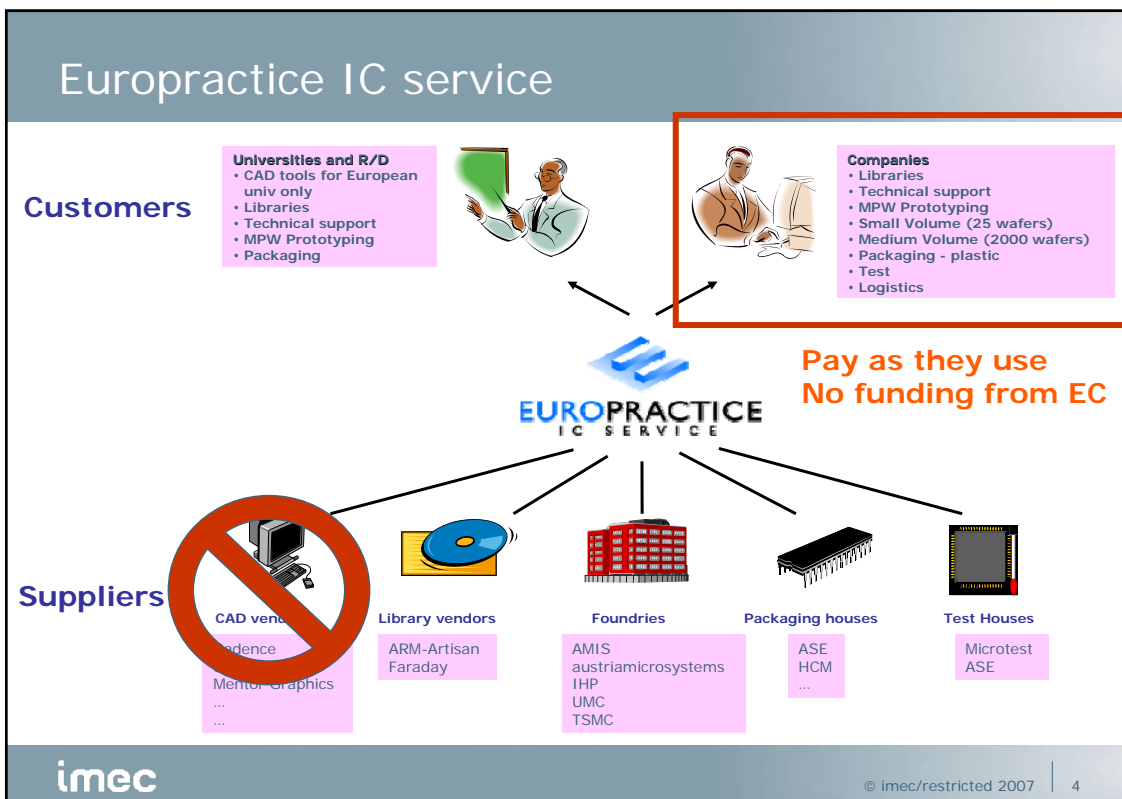
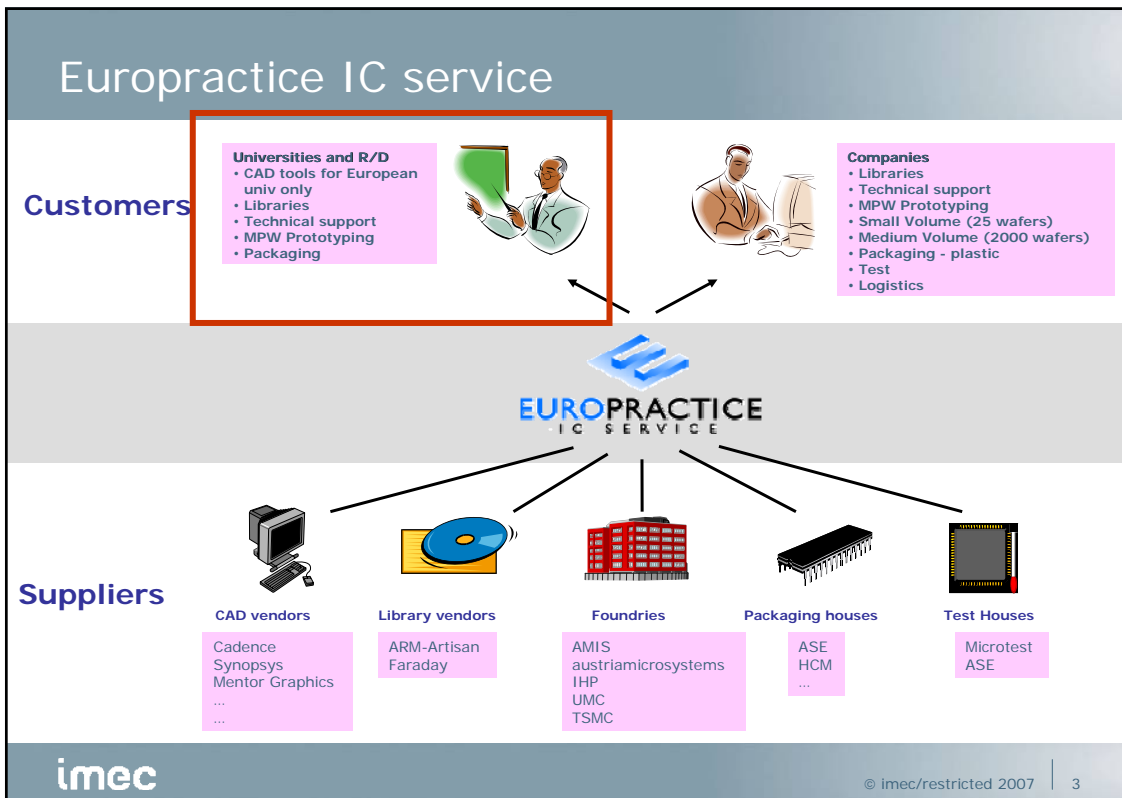
EUROPRACTICE offer of MEMS MPW services

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European universities and research institutes

- Funding from the European Commission since 1989
 - 1989-1995 : Eurochip
 - 1995 – today : Europractice
 - Funding (2006-2010) for
 - Access to cheap CAD tools
 - Access to foundry design rules, cell libraries, ...
 - Access to affordable IC prototyping through MPW (for next 3 years special budget to reduce prices for prototyping in advanced technologies), but universities in principle have to pay for prototyping
 - Technical support
 - Setup of MEMS prototype runs in combination with STIMESI project (stimulation of universities - 4 years)
- Europractice IC service partners
 - IMEC in B (IC Prototyping)
 - RAL (STFC) in UK (CAD offering)
 - Fraunhofer, Erlangen in Germany (IC Prototyping)
- Network of > 650 European universities and R&D institutes



Foundries and Technologies currently available

ARM/Artisan (USA)
Cell libraries and design kits for UMC and TSMC
0.25, 0.18, 0.13µ and 90nm CMOS

AMIS (Belgium)
0.7µ CMOS A/D 2M (B)
0.5µ CMOS A/D 3M (B)
0.35µ CMOS A/D 5M (B)
0.7µ CMOS A/D I2T 100V (B)
0.7µ CMOS A/D I2T 30V (B)
0.35µ CMOS A/D I3T80 80 V (B)
0.5µ CMOS C5 EEPROM (US)

Faraday (Taiwan)
Cell libraries and design kits for UMC 0.25, 0.18, 0.13µ and 90nm CMOS

IHP (Germany)
0.25µ SCG25B SiGe: C 120GHz
0.25µ SCG25C SiGe: C 200GHz
0.25µ SCG25VD SiGe: C 30GHz, BVCEO>7V
0.25µ SG25H1 SiGe: C 200GHz

austriamicrosystems (Austria)
0.8µ CMOS A/D
0.6µ CMOS A/D 3M
0.35µ CMOS A/D 4M
0.8µ CMOS 50V
0.35µ SiGe BiCMOS 4M
0.35µ CMOS 50V
0.35µ CMOS OPTO

UMC (Taiwan)
0.25µ CMOS L + MS/RF
0.18µ CMOS L + MS/RF
0.13µ CMOS L + MS/RF
90nm CMOS L + MS/RF

TSMC (Taiwan)
0.25µ CMOS L + MS/RF
0.25µ CMOS Flash
0.18µ CMOS L + MS/RF
0.18µ CMOS Flash
0.13µ CMOS L + MS/RF
90nm CMOS L + MS/RF
65nm CMOS (industry only)
45nm CMOS (industry only)

Selection criteria
Well-known foundry
Partnership
Flexible prototyping
Small + medium volume

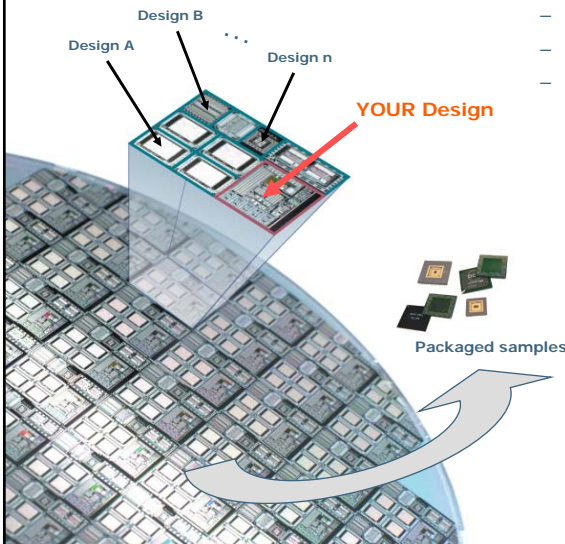
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Cell libraries and design kits

- AMIS, austriamicrosystems, IHP, TSMC : Foundry qualified libraries and design kits
- Faraday cell libraries : for UMC technologies
- ARM/Artisan cell libraries : for UMC and TSMC technologies
- CD-ROM Content
 - documentation : design rules, transistor model parameters, design manual, cell library documentation
 - design kits : electronic files for Cadence, Mentor, Synopsys, ... front-end + back-end design (outlines), P-cells including layout (for universities), Cell libraries

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Multi Project Wafer (MPW) runs to reduce the cost for IC prototyping



- Mask cost is shared between customers
- Wafer fabrication cost is shared between customers
- You pay as you use
- Many MPW runs scheduled in each technology
- Europractice performs extensive DRC, ERC, special substrate checks on all submitted designs

2007 General Europractice MPW runs - Schedule
Version 31.1 April 2007

Run	Technology	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
AMI 0.7µ C07M-D 2M/1P & AMIS 0.7µ C07M-A 2M/1P/Padf/C/HR	AMI	22	27	10	18	27							
AMI 0.5µ C05M-D 3M/1P & AMIS 0.5µ C05M-A 3M/2P/HR	AMI	12	11	21	11								
AMI 0.35µ CMOS EEPROM CSF & CSN	AMI	2	29	7	29	13	24	12					
AMI 0.35µ C035M-D 5M/1P & AMIS 0.35µ C035M-A 5M/2P/HR	AMI	5	23	23	2	10	19						
AMI 0.35µ C035U	AMI					13	22	3					
AMI 0.7µ C07M-12T100 100 V - 2M & 3M options	AMI	22	10	18	27			5					
AMI 0.7µ C07M-12T30 & 12T30E 30 V - 2M	AMI	22	10	18	27			5					
AMI 0.35µ C035 - I3T80U 80 V 4M - 3M optional (5M on special request)	AMI		5	29		3						3	
austrimicrosystems		J	F	M	A	M	J	J	A	S	O	N	D
austrimicrosystems 0.8µ CMOS CXQ 2M/2P/HR				12			2				15		
austrimicrosystems 0.8µ HV CMOS CXZ 50V 2M/2P/HR				12			2				15		
austrimicrosystems 0.35µ CMOS C35B3C1 3M/2P/5V IO		22	26	26	23		4, 25	23		3, 24	29		3
austrimicrosystems 0.35µ CMOS C35B4C3 4M/2P/HR/5V IO		22	26	26	23		4, 25	23		3, 24	29		3
austrimicrosystems 0.35µ CMOS C35OPTO 4M/2P/5V IO							4						3
austrimicrosystems 0.35µ HV CMOS H35 50V 3M			5			7		13				5	
austrimicrosystems 0.35µ HV CMOS H35 50V 4M			5			7		13				5	
austrimicrosystems 0.35µ HV CMOS w/EEPROM H35 3M/2P						7		13				5	
austrimicrosystems 0.35µ SiGe-BiCMOS S35 4M/4P				5			11			10		19	
IHP		J	F	M	A	M	J	J	A	S	O	N	D
IHP SG25V 0.25µ SiGe: C Ft=30GHz@BVCEO>7V		3			16			23			1		
IHP SG25VD 0.25µ SiGe: C Ft=30GHz@BVCEO>7V+RF HV-LDMOS		3			16			23			1		
IHP SG25H1 0.25µ SiGe: C Ft/Fmax=180GHz/220GHz 4M/MIM		3			16			23			1		
IHP SG25H2 0.25µ complementary SiGe: C Ft/Fmax (npn) 170/170GHz/ (ppn)90/120GHz 4M/MIM		3			16			23			1		
IHP SG25H3 0.25µ SiGe: C Ft/Fmax= 120/140GHz 4M/MIM		3			16			23			1		
IHP SG25H1/H2/H3/VD with 5th thick metal option		3			16			23			1		
TSMC		J	F	M	A	M	J	J	A	S	O	N	D
TSMC 0.25µ CMOS General LOGIC, MS OR MS RF			13, 27		10, 24		12	3	14	4	9	6	4
TSMC 0.18µ CMOS General LOGIC, MS OR MS RF		2, 18	13, 20	6, 20	3, 18, 30		22	6, 19	3, 24	7, 21	4, 18	2, 23	6, 20
TSMC 0.13µ CMOS General LOGIC, MS OR MS RF (8-inch)		9		13			8		10		12		6
TSMC 0.13µ CMOS General LOGIC, MS OR MS RF (12-inch)		18	27	27	24	29	26	31	28	25	23	20	
UMC		J	F	M	A	M	J	J	A	S	O	N	D
UMC L250 1P5M MM/RFCMOS ¹⁾			19				19				22		
UMC L180 1P6M GII Logic + MIM ²⁾		22	26	19	23	21	18	23	20	24	22	19	TBD
UMC L180 1P6M MM/RFCMOS ¹⁾ - ²⁾		3	26		30		25		27		29		TBD
UMC L180 CIS 2P4M ⁴⁾			19	ULT		21	CONV		20	ULT		CONV	
UMC L130E 1P8M2T FSG Logic + MIM (FAB 8D or 12i) ⁵⁾ - ¹⁾			12	5 MIM		7	4 MIM		6	3 MIM		5	3 MIM
UMC L130E 1P8M2T MM/RFCMOS (FAB 8D) ¹⁾ - ²⁾ - ⁶⁾ - ⁷⁾ - ¹⁾		8			2			9			8		
UMC L90N 1P9M2T1F Low K Logic SP (FAB 12i)		8				7			27				
UMC L90N 1P9M2T1F Low K Logic/MixeMode LU/SP (FAB 12A) ⁹⁾ - ¹⁰⁾ - ¹²⁾				5				9			29		

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MPW schedule

Technology	J	F	M	A	M	J	J	A	S	O	N	D
AMI Semiconductor												
AMI 0.7µ C07M-D 2M/1P & AMIS 0.7µ C07M-A 2M/1P/Padf/C/HR	22			10		18		27			5	
AMI 0.5µ C05M-D 3M/1P & AMIS 0.5µ C05M-A 3M/2P/HR		12				11			8			
AMI 0.35µ CMOS EEPROM CSF & CSN	2	1	5	7	21		13		24		12	
AMI 0.35µ C035M-D 5M/1P & AMIS 0.35µ C035M-A 5M/2P/HR			5		23		2		10		19	
AMI 0.35µ C035U								13		22		3
AMI 0.7µ C07M-12T100 100 V - 2M & 3M options	22			10		18		27			5	
AMI 0.7µ C07M-12T30 & 12T30E 30 V - 2M	22			10		18		27			5	
AMI 0.35µ C035 - I3T80U 80 V 4M - 3M optional (5M on special request)			5		29			3				3
austrimicrosystems	J	F	M	A	M	J	J	A	S	O	N	D
austrimicrosystems 0.8µ CMOS CXQ 2M/2P/HR			12			2				15		
austrimicrosystems 0.8µ HV CMOS CXZ 50V 2M/2P/HR			12			2				15		
austrimicrosystems 0.35µ CMOS C35B3C1 3M/2P/5V IO	22	26	26	23		4, 25	23		3, 24	29		3
austrimicrosystems 0.35µ CMOS C35B4C3 4M/2P/HR/5V IO	22	26	26	23		4, 25	23		3, 24	29		3
austrimicrosystems 0.35µ CMOS C35OPTO 4M/2P/5V IO						4						3
austrimicrosystems 0.35µ HV CMOS H35 50V 3M		5			7			13			5	
austrimicrosystems 0.35µ HV CMOS H35 50V 4M		5			7			13			5	
austrimicrosystems 0.35µ HV CMOS w/EEPROM H35 3M/2P					7			13			5	
austrimicrosystems 0.35µ SiGe-BiCMOS S35 4M/4P			5			11			10		19	
IHP	J	F	M	A	M	J	J	A	S	O	N	D
IHP SG25V 0.25µ SiGe: C Ft=30GHz@BVCEO>7V	3			16			23			1		
IHP SG25VD 0.25µ SiGe: C Ft=30GHz@BVCEO>7V+RF HV-LDMOS	3			16			23			1		
IHP SG25H1 0.25µ SiGe: C Ft/Fmax=180GHz/220GHz 4M/MIM	3			16			23			1		
IHP SG25H2 0.25µ complementary SiGe: C Ft/Fmax (npn) 170/170GHz/ (ppn)90/120GHz 4M/MIM	3			16			23			1		
IHP SG25H3 0.25µ SiGe: C Ft/Fmax= 120/140GHz 4M/MIM	3			16			23			1		
IHP SG25H1/H2/H3/VD with 5th thick metal option	3			16			23			1		
TSMC	J	F	M	A	M	J	J	A	S	O	N	D
TSMC 0.25µ CMOS General LOGIC, MS OR MS RF		13, 27		10, 24		12	3	14	4	9	6	4
TSMC 0.18µ CMOS General LOGIC, MS OR MS RF	2, 18	13, 20	6, 20	3, 18, 30		22	6, 19	3, 24	7, 21	4, 18	2, 23	6, 20
TSMC 0.13µ CMOS General LOGIC, MS OR MS RF (8-inch)	9		13			8		10		12		6
TSMC 0.13µ CMOS General LOGIC, MS OR MS RF (12-inch)	18	27	27	24	29	26	31	28	25	23	20	
UMC	J	F	M	A	M	J	J	A	S	O	N	D
UMC L250 1P5M MM/RFCMOS ¹⁾		19				19				22		
UMC L180 1P6M GII Logic + MIM ²⁾	22	26	19	23	21	18	23	20	24	22	19	TBD
UMC L180 1P6M MM/RFCMOS ¹⁾ - ²⁾	3	26		30		25		27		29		TBD
UMC L180 CIS 2P4M ⁴⁾		19	ULT		21	CONV		20	ULT		CONV	
UMC L130E 1P8M2T FSG Logic + MIM (FAB 8D or 12i) ⁵⁾ - ¹⁾		12	5 MIM		7	4 MIM		6	3 MIM		5	3 MIM
UMC L130E 1P8M2T MM/RFCMOS (FAB 8D) ¹⁾ - ²⁾ - ⁶⁾ - ⁷⁾ - ¹⁾	8			2			9			8		
UMC L90N 1P9M2T1F Low K Logic SP (FAB 12i)	8				7			27				
UMC L90N 1P9M2T1F Low K Logic/MixeMode LU/SP (FAB 12A) ⁹⁾ - ¹⁰⁾ - ¹²⁾			5				9			29		

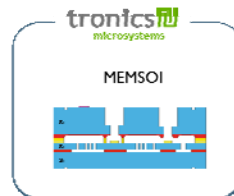
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Extension to MEMS

- Use existing IC prototyping service and extend

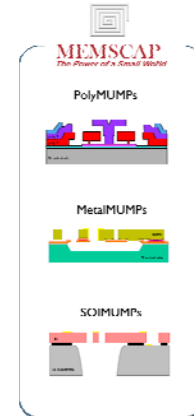
- Start with discrete MEMS technologies
- Initially in 2008

- TRONIC's MEMSOI



- MEMSCAP MEMS technologies

- University customers through Europractice
- Companies directly served by TRONIC's and MEMSCAP
- Later on with other MEMS technologies



- Goal is to offer integrated MEMS on the longer term
- In close cooperation with STIMESI