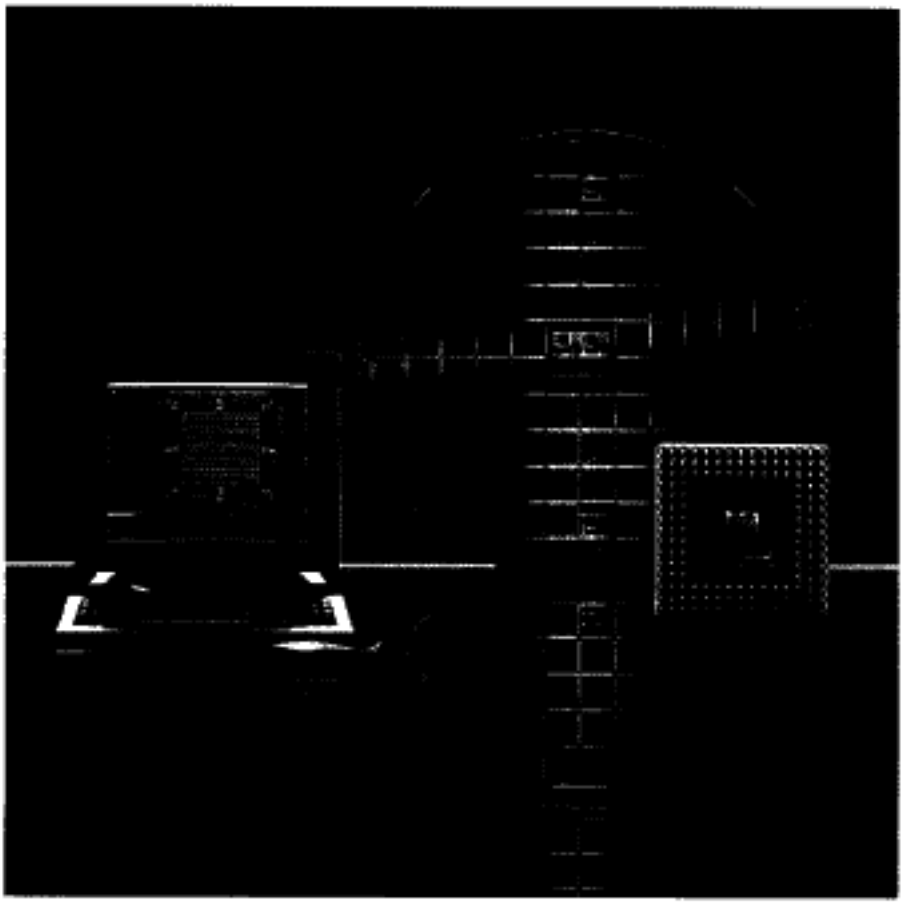
SIEMENS

ew Product Release

Semicustom ICs

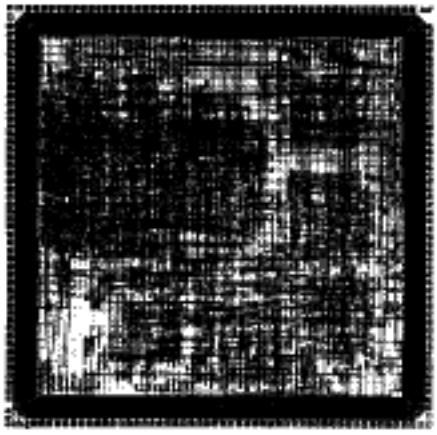


SCxE6: Sub-Micron ASICs »Made in Europe«

Continuing development of the proven Megalogic process now enables Siemens to offer their proven channelless gate-array architecture with sub-micron transistors.

Offering a 30 % speed improvement over its 1 micron predecessor, the SCxE6 family's enhanced packing density, coupled with the new Siemens Logic Design System CAD tools, offers the gate-array performance needed to revolutionize *your* system design.

All **»Made in Europe«** of course!



SCxE6: »Sea-of-Gates« Gate-Arrays

Siemens announces a sub-micron generation of channelless gate-arrays based on the proven Megalogic process

Features

- Advanced 0.8 micron (drawn gate-length) ACMOS5H Megalogic technology
- 0.28 ns speed (2 input NAND, fanout = 2)
- Slew rate control option
- High packing density featuring over 300,000 available gates
- Full workstation support (e.g.Cadence, Mentor, Valid, Dasix)
- Reduced design turnaround time due to cell preplacement and delay calculation
- Fully hierarchical design flow capability
- Alternately sourced by Toshiba

SCxE6
Electrical Characteristics

Absolute Maximum Ratings

Parameter	Symbol	Limits	Unit
DC-supply voltage	V_{DD}	−0.3 ... 7.0	V
Input voltage	V_I	−0.3 ... V_{DD} + 0.3	V
Output voltage	V_O	−0.3 ... V_{DD} + 0.3	V
DC-input diode current	I_{IK}	−20 ... 20	mA
DC-output current	I_O	(1)	mA
DC-output diode current	I_{OK}	−20 ... 20	mA
Storage temperature	T_{stg}	−65 ... 150	°C
Junction temperature (during operation)	T_j	150	°C

(1) See table DC-specification I/O-cells in data sheets

Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Unit
DC-Supply Voltage (V_{SS} = 0 V) (1)	V_{DD}	4.5	5.5	V
Input voltage	V_I	0	V_{DD}	V
Output voltage	V_O	0	V_{DD}	V
Input rise and fall times	t_r, t_f	0	5	ns
Junction temperature (2)	T_j	0	125	°C

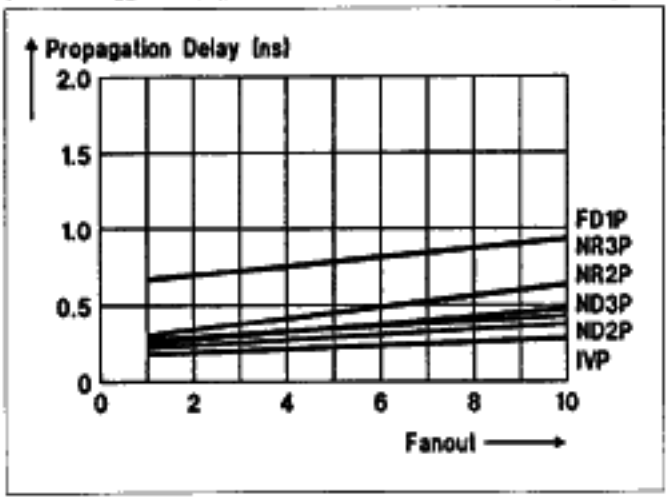
(1) Functional range of circuits with CMOS-compatible inputs is 3.0 ... 6.0 V.
(2) Extended temperature range on request

Macro Cells

High Speed ROM / Low Power ROM	
• Configuration	64 – 1024 words; 2 – 32 Bit
• Capacity	max. 16 Kbit/Block
• Read Access Time	10/14 ns typical
Single Port RAM	
• Configuration	8 – 256 words; 4 – 36 bit
• Capacity	max. 4.5 Kbit/Block
• Read Access Time	6 ns typical
Triple Port RAM	
• Configuration	16 – 64 words; 4 – 36 bit
• Capacity	max. 2.3 Kbit/Block
• Read Access Time	5 ns typical

Basic Cell Delay vs Fanout

(SCxE6 V_{DD} = 5 V, T_A = 25 °C with estimated wiring lengths)



SCxE6
Series Design Flow

Design Automation – The Key to Success

The SCxE6 gate-array family is fully supported by ADVANCAD, a highly sophisticated CAD system for the development of VLSI ASICs. ADVANCAD is based on industry standard software packages supplemented with the Siemens Logic Design System (SLDS), available for use on popular engineering workstations.

SLDS – Workstation Support

The Siemens Logic Design System (SLDS), used in conjunction with industry standard workstation CAD packages, offers the user an ASIC design system without parallel. Powerful enough to permit cell preplacement, accurate enough to correctly calculate the effects of parasitic wiring capacitance, even *before netlist transfer* to the "back-end" design environment. This may reduce the turnaround time of your design significantly.
And flexible enough to interface to *your* existing CAD environment!

Customer Interfaces

Customer develops up to the interface shown			
Development steps	Customer develops the logic diagram	Customer with workstation	Customer with workstation and own CAD-system, also silicon foundry
• Product idea/circuit design • Conversion of circuit into logic diagram by using design manual and cell library			
• Logic entry • Logic simulation			
• Layout generation			
• Logic simulation including wiring delays			
• Approval of simulation results			
• Testprogram generation • Tape for mask generation	Siemens Design Centre		
• Wafer fabrication • Wafer test • Assembly • Testing • Samples	Siemens IC Fabrication		

responsibility of Siemens
responsibility of customer

Available Masters

Part Number	Gate[1] Complexity	Estimated[2] Usable Gates	Maximum Pads[3]	max I/O Pads[4]
SC33 E6	33000	13000	158	144
SC41 E6	41000	17000	174	160
SC54 E6	54000	22000	198	184
SC70 E6	70000	28000	222	208
SC108 E6	108000	43000	270	256
SC132 E6	132000	53000	294	280 (256)
SC177 E6	177000	71000	334	320 (256)
SC235 E6	235000	94000	382	368 (256)
SC302 E6	302000	120000	430	416 (256)

Notes: 1. Raw-gates. 2. Based on 40 % array utilization. Actual utilization varies, depending on cell types used.
3. Additional I/O pads may be configured as V_{DD}/V_{SS}, subject to number and drive of output buffers. 4. Tester limitation of 25 % I/O.

Standard Packaging Spectrum

Master	SC33 E6	SC41 E6	SC54 E6	SC79 E6	SC108 E6	SC132 E6	SC177 E6	SC235 E6	SC302 E6
max I/O Pads	144	160	184	208	256	280	320	368	416
P-LCC-28	+								
P-LCC-44	+	+	+	+					
P-LCC-68	+	+	+	+	+	+			
P-LCC-84	+	+	+	+	+	or			
P-MQFP-80	+	+	+	or					
P-MQFP-100	+	+	+	+					
P-MQFP-144	+	+	+	+	+	+	+		
P-MQFP-160		+	+	+	+	+	+		
P-MQFP-208					+	+	+	□	
P-MQFP-240					or	or	or	or	or
P-MQFP-304					or	or	or	or	or
M-QUAD-160*)	or	or	or	or	or	or	or	or	or
M-QUAD-208*)				or	or	or	or	or	or
M-QUAD-240*)					or	or	or	or	or
M-QUAD-304*)							or	or	or
C-PGA-64-D	+	+	+	+					
C-PGA-72-D	+	+	+	+	+				
C-PGA-88-D	+	+	+	+	or	or	+	+	
C-PGA-120-D	+	+	+	+	+	+			
C-PGA-132-D	+	+	+	+	or	or			
C-PGA-144-D				+	+	+			
C-PGA-223-D				+	+	+	or	+	+
C-PGA-299-D				or	or	or	or	+	+
C-PGA-391-D								or	or
C-PGA-144-U	+	+	+	+					
C-PGA-179-U			+	+	+	+	+		
C-PGA-224-U				+	+	+			

+ = available □ = in preparation or = on request U = cavity up D = cavity down
*) M-QUAD is a trademark owned by Olin

Please enquire for any type not shown

Worldwide Design Support

Design Centres: Munich, Stuttgart, Hanover, Düsseldorf, Milan, London*, Zurich*, Santa Clara

*) Application Support

Additional Information available:

SCxE6 cell catalogue
SLDS manual
Packaging catalogue

Siemens Aktiengesellschaft