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# PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN Number: **04-17**  
Date Issued: **November 12, 2004**  
Product(s) Affected: **PI6C2405A-1, 2405A-1I**  
**PI6C2409-1, 2409-1I, 2409-1H, 2409-1HI**  
Manufacturing Location Affected: **Moving these CSMS Fab 1 products to already approved CSMS Fab 2.**  
Date Effective: **February 12, 2005**  
**(Any remaining Fab 1 inventory may ship until depleted).**

Means of Distinguishing Changed Devices:

- Product Mark:
- Back Mark
- Date Code: **Added letter code \***
- Other

**\* Product will have a letter "B" as the first character of the date code to signify CSMS Fab 2. All product samples should be identified this way.**

Contact: **Ed Mello**  
Title: **Director, Quality Systems**  
Phone: **(408) 435-0800, Ext. 207**  
Fax: **(408) 321-0324**  
eMail: [emello@pericom.com](mailto:emello@pericom.com)

Attachment:  Yes;  No

**No significant product features changed. Pericom Product and Design Engineering Characterization data confirmed Fab 2 devices should have no critical performance differences from Fab 1 products.**

Samples: **Request from Sales.**

Description and Purpose of Change:  
**Products are transferring from approved wafer fab subcontractor Chartered Semiconductor Manufacturing Singapore's (CSMS) Fab 1, to the already approved Fab 2 facility. These devices use the same base array die, design and process, and will be manufactured in Fab 2 with essentially the same qualified CMOS 0.5- $\mu$ m SPDM process type as used in Fab 1. CSMS closed the older 150-mm wafer Fab 1 facility at the end of March 2004. Fab 2 will manufacture these Pericom products using 200-mm wafers. See CSMS website for more information:**  
<http://www.charteredsemi.com/media/corp/2003n/20030213.asp>

- Die Technology
- Wafer Fabrication
- Assembly Process
- Equipment
- Material
- Testing
- Manufacturing Site
- Data Sheet
- Other: **CSMS Fab 1 closure, porting to Fab 2**

Reliability/Qualification Summary: *Generic data using same process and design rules:* [http://www.pericom.com/pdf/gen/rel\\_CSM2.pdf](http://www.pericom.com/pdf/gen/rel_CSM2.pdf)

Customer Acknowledgement of Receipt:

Customer: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

E-Mail: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

Approval for shipments prior to effective date

Customer Comments (Optional): \_\_\_\_\_



Confidential/For Customer Use Only

Date: June 14, 2004

**Subject: PI6C2405A-1 CSM Fab1 and CSM Fab2 Characterization Comparison Report**

**Reference:**

CSM Fab 1 version:

Device array: CD89

Process: CSM Fab-1, 0.5µm 3.3V CMOS

Date Code: A0344ZC

Lot #: W/O#238089

Package: W8

CSM Fab2 version:

Device array: CDF2

Process: CSM Fab-2, 0.5µm 3.3V CMOS

Date code: BZBA04190C

Lot #: EA13210.1A

Package: W8

**Equipment:**

TEK TDS694C with P6249 probe & ASA M1

TEK DG2040 Data Generator

HP8082A Pulse Generator

HP8116A Function Generator

R & S Signal Generator SMY01

HP4145B

HP TIA

HP Power Supply

**Results:**

**Table 1.** PI6C2405A-1 DC Characteristics at 25C.

Parameter	Test Condition	Vdd V	CSM Fab1 Data	CSM Fab2 Data	Spec Limits
V <sub>ol</sub>	I <sub>ol</sub> = 8mA	3.0	0.197V	0.227V	max 0.4V
V <sub>oh</sub>	I <sub>oh</sub> = -8mA	3.0	2.767V	2.735V	min 2.4V
I <sub>off</sub> (CLKIN)	V <sub>in</sub> = 3.6V V <sub>in</sub> = 5.5V (5V tolerant)	0	122pA 159pA	-242pA 986pA	input 5V tolerant
I <sub>il</sub> (CLKIN)	V <sub>in</sub> = 0V Pull-down resistance measured at 0V	3.6	-122.0nA 13.7Kohms	-50.48nA 19.2Kohms	max 50uA
I <sub>ih</sub> (CLKIN)	V <sub>in</sub> = 3.6V V <sub>in</sub> = 5.5V (5V tolerant)	3.6	94.80uA 95.0uA	71.36uA 72uA	max 100uA
I <sub>dd</sub> (Static)	all outputs open, CLKIN=0 or 1	3.6	3.343mA	3.648mA	no spec

Equipment used: HP4145B, HP8082A Pulse Gen., TEK TDS694C scope & P6249 probes, HP Power Supply.

**Table 2.** PI6C2405A-1 DC I<sub>ol</sub> and I<sub>oh</sub> at V<sub>dd</sub> = 3.0V, 25C, no spec limits.

V <sub>ol</sub> / V <sub>oh</sub> V	CSM Fab1 I <sub>ol</sub> , mA	CSM Fab2 I <sub>ol</sub> , mA	CSM Fab1 I <sub>oh</sub> , mA	CSM Fab2 I <sub>oh</sub> , mA
0	0	0	-43.17	-42.35
0.5	19.17	16.73	-41.73	-40.56
1.0	33.00	28.87	-39.72	-38.02
1.5	40.17	35.58	-35.94	-33.68
2.0	42.51	38.22	-28.42	-26.19
2.5	43.01	38.96	-16.26	-14.72
3.0	43.14	39.16	0	0

Equipment used: HP4145B.

**Table 3.** PI6C2405A-1 Dynamic Supply Current at Vdd = 3.6V, 25C.

CLKIN Freq. MHz	CSM Fab1 Idd, mA (15pF load at 5 outputs)	CSM Fab2 Idd, mA (15pF load at 5 outputs)	CSM Fab1 Idd, mA (30pF load at 5 outputs)	CSM Fab2 Idd, mA (30pF load at 5 outputs)
1 (unlock)	5 (unlock)	4 (unlock)	6 (unlock)	5 (unlock)
10	12	11	16	14
33	29	27	39	36
50	42	39	56	52
66	53	49	71	68
100	81	78	109	99
133	109	99	129	113
150	118	106	136	117
280 (unlock)	113 (unlock)	102 (unlock)	107 (unlock)	98 (unlock)

Equipment used: HP Power Supply, TEK DG2040 Data Generator, TEK TDS694C scope & P6249 probes.

**Table 4.** PI6C2405A-1 Min Vdd for PLL to lock at different frequencies, 25C, all 5 outputs loaded with 15pF or 30pF.

CLKIN Freq. MHz	CSM Fab1 Min Vdd, V for PLL to lock (15pF load at 5 outputs)	CSM Fab2 Min Vdd, V for PLL to lock (15pF load at 5 outputs)	CSM Fab1 Min Vdd, V for PLL to lock (30pF load at 5 outputs)	CSM Fab2 Min Vdd, V for PLL to lock (30pF load at 5 outputs)
10	2.10	1.77	2.63	1.79
66.7	2.46	2.11	2.62	2.11
133.3	2.60	2.23	2.82	2.27

Equipment used: TEK DG2040 Data Generator, TEK TDS694C Scope & P6249 probes, HP Power Supply.

**Table 5.** PI6C2405A-1 Min and Max Frequencies at 25C, all 5 outputs loaded with 15pF or 30pF.

Min freq. spec limit = 10MHz; Max freq spec limit = 100MHz for 30pF load and 133MHz for 15pF load.

Vdd V	CSM Fab1 Min Freq., MHz, for PLL to lock (15pF load)	CSM Fab2 Min Freq., MHz, for PLL to lock (15pF load)	CSM Fab1 Min Freq., MHz, for PLL to lock (30pF load)	CSM Fab2 Min Freq., MHz, for PLL to lock (30pF load)	CSM Fab1 Max Freq., MHz, for PLL to lock (15pF load)	CSM Fab2 Max Freq., MHz, for PLL to lock (15pF load)	CSM Fab1 Max Freq., MHz, for PLL to lock (30pF load)	CSM Fab2 Max Freq., MHz, for PLL to lock (30pF load)
3.0	3.5	1.6	3.9	1.7	224	183	148	154
3.3	3.7	1.7	4.3	1.8	231	189	153	153
3.6	3.9	1.8	4.8	1.9	203	193	156	154

Equipment used: TEK DG2040 Data Generator, TEK TDS694C Scope & P6249 probes, HP Power Supply.

**Table 6.** PI6C2405A-1 input to output mean delays measured from CLKIN rising edge at Vdd/2 to OUTx rising edge at Vdd/2, SSC off, 25C.

Freq. MHz	Output Load pF	Output measured	CSM Fab 1 tpd, ps Vdd=3.0V	CSM Fab 1 tpd, ps Vdd=3.3V	CSM Fab 1 tpd, ps Vdd=3.6V	CSM Fab 2 tpd, ps Vdd=3.0V	CSM Fab 2 tpd, ps Vdd=3.3V	CSM Fab 2 tpd, ps Vdd=3.6V
66.67	30	OUT0	-49	30	66	-107	-82	-53
		OUT1	-5	56	95	-29	-5	18
		OUT2	11	72	111	-49	-27	-3
		OUT3	-58	3	35	-26	-12	6
		OUT4	-118	-47	-14	-55	-39	-19
		Mean	-44	23	59	-53	-33	-10
		Min	-118	-47	-14	-107	-82	-53
Max	11	72	111	-26	-5	18		
133.3	15	OUT0	-104	-97	-85	-10	4	3
		OUT1	-79	-61	-37	-30	-16	-13
		OUT2	-117	-91	-61	-50	-40	-46
		OUT3	-45	-17	13	-13	12	11
		OUT4	-49	-26	-6	-9	8	9
		Mean	-79	-58	-35	-22	-6	-7
		Min	-117	-97	-85	-50	-40	-46
Max	-45	-17	13	-9	12	11		

Equipment used: HP8082A Pulse gen., HP Power Supply, TEK TDS694C Scope & P6249 probes & M1.







