PERICOM Semiconductor Corporation
3545 North First St. • San Jose, CA 95134 • USA

PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN Number: **05-06**

Date Issued: **February 17, 2005**

Product(s) Affected: **PI5C3244 (all package types)**

Manufacturing Location Affected: **CSMC-HJ (China PRC)**

Date Effective: **May 17, 2005 – standard 90 day waiting period** ***(some customers may require additional time).***
Supplies of current product may be very limited.

Means of Distinguishing Changed Devices:

☐ Product Mark:

☐ Back Mark

☒ Date Code: **Wafer Fab ID letter code ***

☐ Other

**** W - last letter of date code signifies CSMC-HJ***

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Attachment: ☒ Yes; ☐ No

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

Samples: **Request from Pericom Sales.**

Description and Purpose of Change:

Product is transferring from wafer fab subcontractor Chartered Semiconductor Manufacturing Singapore's (CSMS) Fab 1 (which closed operations in March 2004), to previously approved CSMC-HJ wafer fab in China. The device maintains the same design and will be manufactured at CSMC-HJ with essentially the same qualified CMOS 0.6-μm SPDM process type as used in CSMC Fab 1. The CSMS wafer fab equipment was sold to CSMC-HJ in 2004, and Pericom is using the same CSMS Fab 1 masks. See the CSMC-HJ website for more information about their operations: http://www.csmc-hj.com.cn/csmc/english/index.asp

☐ Die Technology

☒ Wafer Fabrication

☐ Assembly Process

☐ Equipment

☐ Material

☐ Testing

☒ Manufacturing Site

☐ Data Sheet

☐ Other:

Reliability/Qualification Summary: **Electrical Characterization and Reliability Qualification reports are attached.**

Customer Acknowledgement of Receipt:

Customer: _____

Name: _____

Title: _____

Date: _____

E-Mail: _____

Phone: _____

Fax: _____

☐ Approval for shipments prior to PCN effective date

Customer Comments (Optional): _____

Confidential/For Customer Use Only

Date: January 26, 2005

Subject: PI5C3244 Characterization Comparison Report

Introduction:

Pericom's PI5C3244 is a 8-Bit, 2-Port Bus Switch that was transferred from **CSM-S Fab-1** to **CSMC-HJ** (PRC) due to the Chartered wafer fab shutting down in March 2004. The key processing equipment and masks were transferred from CSM-S, allowing CSMC-HJ to use the same process and wafer size for this and a number of other products. Material from both facilities was compared side by side.

Reference:

CSMC-HJ (PRC)
Die Array: BS24U02
Fab Process: 0.6 um, 1P2M, 5V CMOS
Lot #: EA49FF1.2A
Date Code: Y0451XW
Package: QSOP (Q20)

CSM-S (Singapore
Die Array: BS24
Fab 1 Process: 0.6 um, 1P2M, 5V CMOS
WO: 255289.1
Date Code: Y0417ZC
Package: QSOP (Q20)

Test Equipment:

HP power supply & DMM,
HP4145B DC Analyzer
HP4285A LCR Meter
TDS8000 Oscilloscope, TX P6209 Active Probe
HP8082A Signal Generator
HP8110A Pulse Generator
Temptronix X-Stream 4300

Tables:

Table 1: DC Characteristics
Table 2: Ron Measurements, all path, 25C
Table 3: Capacitance, 25C
Table 4: AC Characteristics
Table 5: Dynamic ICC, Vcc=5.25V, 25C

Conclusion:

Both wafer fabs are closely matched and meet datasheet specification.

Table 1. DC Characteristics

			CSMC-HJ			CSM-S FAB-1					
Symb.	**Test Conditions**	**Vcc**	**-40°C**	**25°C**	**90°C**	**-40°C**	**25°C**	**90°C**	**Min Spec**	**Max Spec**	**Unit**
VIH	Input High Voltage	4.75 V	1.315	1.310	1.300	1.415	1.395	1.380	2.0		V
VIH	Input High Voltage	5.00 V	1.350	1.355	1.345	1.455	1.435	1.400	2.0		V
VIH	Input High Voltage	5.25 V	1.395	1.400	1.395	1.495	1.480	1.470	2.0		V
VIL	Input Low Voltage	4.75 V	1.540	1.535	1.550	1.615	1.605	1.610		0.8	V
VIL	Input Low Voltage	5.0 0V	1.595	1.595	1.610	1.670	1.665	1.670		0.8	V
VIL	Input Low Voltage	5.25 V	1.650	1.655	1.675	1.725	1.720	1.730		0.8	V
VH	Input Hysteresis	4.75 V	0.225	0.225	0.250	0.200	0.210	0.230	Typ.	0.15	V
VH	Input Hysteresis	5.00 V	0.245	0.240	0.265	0.215	0.230	0.270	Typ..	0.15	V
VH	Input Hysteresis	5.25 V	0.225	0.255	0.280	0.230	0.240	0.260	Typ.	0.15	V
Ron	Ion=48mA, Vin=0 V	4.75 V	4.04	4.69	5.88	4.14	4.91	6.05		7	Ω
Ron	Ion=15mA, Vin=2.4 V	4.75 V	6.47	7.80	10.10	7.13	8.67	11.10		15	Ω
IIL	Vin= 0 V	5.25 V	-16p	-66p	-51p	-187p	-3.7p	197p		-1u	A
IIH	Vin= 5.25 V	5.25 V	299p	50p	3.8n	788p	104p	345p		1u	A
IOZL	Voz= 0 V	5.25V	-1.5n	237p	-112p	-2n	-243p	-318p		-1u	A
IOZH	Voz= 5.25V	5.25 V	411p	-373p	2.8n	1.7n	-315p	395p		1u	A
VIK	I/O Pins, I=-18mA	4.75 V	-0.81	-0.75	-0.68	-0.84	-0.77	-0.69	Typ..	-1.2	V
VIK	S Pin, I=-18mA	4.75 V	-0.86	-0.79	-0.72	-0.88	-0.80	-0.72	Typ..	-1.2	V
ICCL	Vin=0 V	5.25 V	1.7n	1.3n	8.5n	895p	1.6n	2.5n		3	uA
ICCH	Vin=5.25V	5.25 V	1.5n	-24p	6.6n	684p	715p	1.14n		3	uA
ΔICC	Vin=3.4V	5.25 V	943u	873u	849u	789u	740u	705u		2.5m	A

Table 2. Ron Measurement, all paths, Vcc=4.75V, 25C

	CSMC-HJ		FAB-1		
Channel	**Ion=+48mA Vin=0V**	**Ion=+15mA Vin=2.4V**	**Ion=+48mA Vin=0V**	**Ion=+15mA Vin=2.4V**	**unit**
1A0 – 1B0	4.69	7.80	4.91	8.80	Ω
1A1 – 1B1	4.46	7.47	4.78	8.86	Ω
1A2 – 1B2	4.48	7.47	4.76	8.86	Ω
1A3 – 1B3	4.48	7.41	4.81	8.94	Ω
2A0 – 2B0	4.63	7.73	4.81	8.80	Ω
2A1 – 2B1	4.52	7.54	4.82	8.86	Ω
2A2 – 2B2	4.56	7.60	4.81	8.86	Ω
2A3 – 2B3	4.50	7.54	4.80	8.84	Ω
Max Limit	**7**	**15**	**7**	**15**	Ω

Table 3. Capacitance at 25C

Symbol	**Description**	**Vcc**	**CSMC-HJ**	**CSM-S FAB-1**	**Typ**	**Units**
Cin	Control Input	5 V	3.35	3.80	6	pF
Coff	A Cap, Switch Off	5 V	5.50	5.20	6	pF
Coff	B Cap, Switch Off	5 V	5.30	5.40	6	pF
Con	A-B, Switch On	5 V	11.95	11.35	12	pF

HP4285A LCR Meter

Table 4. AC Characteristics

			CSMC-HJ			CSM-S FAB-1				
Symbol	**Vcc**	**Load**	**-40°C**	**25°C**	**90°C**	**-40°C**	**25°C**	**90°C**	**Max Spec**	**Units**
tpZH	4.75 V	Load A	2.51	2.68	2.77	2.34	2.60	2.77	5.6	nS
tpHZ	4.75 V	Load A	2.93	3.25	3.39	3.21	3.26	3.51	5.2	nS
tpZL	4.75 V	Load B	2.71	2.95	3.11	2.62	2.82	3.06	5.6	nS
tpLZ	4.75 V	Load B	3.08	3.22	3.40	2.80	3.01	3.20	5.2	nS

Load A: 50pF//500Ω

Load B: 50pF//500Ω, 500Ω to 7V

Table 5. Dynamic Icc, Vcc=5.25V

Frequency	**CSMC-HJ**	**CSM-S FAB-1**	**Units**
1MHZ	0.09	0.07	mA
5MHZ	0.43	0.35	mA
10MHZ	0.86	0.70	mA
20MHZ	1.72	1.40	mA
30MHZ	2.61	2.14	mA

PERICOM Semiconductor Corporation
www.pericom.com

Date: January 28, 2005

Subject: *CSMC-HJ CMOS 0.6 μm Wafer Fab Reliability Report*

CSMC-HJ's (http://www.csmc-hj.com.cn/csmc/english/index.asp) CMOS, 5-volt, 0.6-micron process was recently verified for acceptability to Pericom's standard die level process qualification requirements. This facility has previously been qualified on their 0.8-micron CMOS process in 2004. This 0.6-micron process is a direct transfer of the equipment and Pericom masks from CSMS Fab 1 in Singapore.

A total of 130 units have thus far successfully completed 1000 hours of Dynamic High Temperature Operating Life (DHTOL) test at 150°C and 5.5 volts applied bias with no failures. The PI5C3383 product was used as the qualification vehicle, and therefore all products using this same process technology and design rules will meet Pericom's Wafer Fab Process Qualification requirements. This can include: PI5C3244, 3245, 3383, 3384, 3861, 32X2245, 32X383, 32X384, 34X245, and 34X2245, as well as other device types from other product families. It also passed High Temp Storage Life (HTSL), Unbiased HAST (UHAST), and Temperature Cycle (TMCL) testing as shown below.

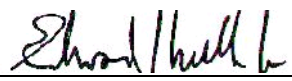
Based on 1000 hours of accelerated life test temperature and voltage operating conditions, the equivalent long-term life test FIT rate is currently 69.7, with a calculated MTBF of 130,000 hours. The life test will continue on to 3000 hours total, and the 2000-hour time point is now in process. The FIT calculation was made using the Arrhenius equation, with an Activation energy of 0.5 eV, an assumed system operating temperature of 55 °C, and a Confidence factor of 60%.

Pericom's Qualification Test results:

Rel Lot #	Device Type	Pkg. Type	Date Code	Stress Test	Stress Condition	Stress Duration	Sample Units	Results Pass/Fail
Q04013-1A	PI5C3383	S24	X0444OW	DHTOL	150°C, 5.5 v	168 hrs	130	130/0
Q04013-1A	PI5C3383	S24	X0444OW	DHTOL	150°C, 5.5 v	500 hrs	130	130/0
Q04013-1A	PI5C3383	S24	X0444OW	DHTOL	150°C, 5.5 v	1000 hrs	130	130/0
Q04013-1A	PI5C3383	S24	X0444OW	DHTOL	150°C, 5.5 v	2000 hrs	130	*In process*
Q04013-1A	PI5C3383	S24	X0444OW	DHTOL	150°C, 5.5 v	3000 hrs	130	*TBD*
Q04013-1B	PI5C3383	S24	X0444OW	HTSL	150°C	168 hrs	100	100/0
Q04013-1B	PI5C3383	S24	X0444OW	HTSL	150°C	500 hrs	100	100/0
Q04013-1B	PI5C3383	S24	X0444OW	HTSL	150°C	1000 hrs	100	100/0
Q04013-1C	PI5C3383	S24	X0444OW	UHAST	130°C	96 hrs	100	100/0
Q04013-1D	PI5C3383	S24	X0444OW	TMCL	-65, +150 °C	500 cycles	100	100/0

If there are any questions about this device qualification, please let me know.

Regards,



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