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

PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN Number: **04-11**

Date Issued: **June 18, 2004**

Product(s) Affected: **PI5C3384C**

Manufacturing Location Affected: **Hynix Semiconductor**

Date Effective: **September 18, 2004 – standard 90 day waiting period (some customers may require longer timeframes)**

Means of Distinguishing Changed Devices:

☐ Product Mark:

☐ Back Mark

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

☐ Other

**** G - last letter of date code signifies Hynix***

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Attachment: ☒ Yes; ☐ No

Samples: **Available when requested from Pericom Sales.**

Description and Purpose of Change:

To increase Pericom's manufacturing capacity for this product, we've added this device type to Hynix's standard 0.5-micron (HS0F5F) process that was approved by Pericom over 5 years ago. Generic Information on Hynix's basic process is at:

http://www.hynix.com/eng/products/system_ic/sms/down/procs_5um_5VSTD.pdf

Hynix Semiconductor's facilities are certified to ISO-9000-2000 & ISO-14001, and are located in Gumi, Korea. Their website is at:

http://www.hynix.com/eng/index.html

☐ Die Technology

☒ Wafer Fabrication

☐ Assembly Process

☐ Equipment

☐ Material

☐ Testing

☒ Manufacturing Site

☐ Data Sheet

☐ Other:

Reliability/Qualification Summary: **Copy of Electrical Characterization report is attached.**

Customer Acknowledgement of Receipt:

Customer: _____

Name: _____

Title: _____

Date: _____

E-Mail: _____

Phone: _____

Fax: _____

☐ Approval for shipments prior to PCN effective date

Customer Comments (Optional): _____

PERICOM Semiconductor Corporation

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Date: November 5, 2003

Subject: PI5C3384C Characterization Comparison Report

Introduction:

The PI5C3384C product was characterized comparing the new Hynix version with the CSMS wafer fab version. Ron and AC measurements were done side by side for a direct comparison

Reference:

Hynix Process: 0.5µm, 1P2M, 5V Process – 8-inch wafer
Die Array: P5CH
Die size: 23 x 60 mils
Date Code: Z03430G
Lot #: ENYD02
Package: QSOP (Q24)

CSMS Process: 0.6 µm, 1P2M, 5V Process – 6-inch wafer
Die Array: BS24
Die size: 34.6 x 64 mils
Date Code: Y0302CZC
Lot #: 208190
Package: QSOP (Q24)

Equipment:

HP power supply & DMM
HP4145B DC Analyzer
HP4285A LCR Meter
TDS8000 Oscilloscope
HP8110A Pulse Generator
HP8116A Pulse Generator
Thermostream TP041000-A

Tables:

Tables 1-2: DC Characteristics - Tester
Table 3: DC Characteristics - Bench
Table 4: Ron Measurements, all paths, Vcc=4.75V, 25°C - Bench
Table 5: Capacitance at 25C - Bench
Table 6: AC Characteristics - Bench
Table 7: Dynamic ICC, Vcc=5.25V, 25°C - Bench
Table 8: Undershoot Protection Test, Vcc=5V - Bench

Conclusion:

1. Ron of Hynix version is 0.5Ω lower on average at 25°C, than that of CSMS at Ion = 48mA, and 0.1Ω lower at Ion = 15mA.
2. The speed of Hynix version is somewhat faster than that of CSMS
3. The Hynix product meets all datasheet spec requirements, and is equivalent to the CSMS product.

Table 1. DC Characteristics, 25 Units, 25C –TESTER DATA

			Hynix				Specification		
Param.	**Test Conditions**	**Vcc**	**Min**	**Avg**	**max**	**Std Dev**	**Min**	**Max**	**Units**
VIH	Input High Volt.	4.75V	1.21	1.22	1.26	0.017	2.00		V
VIL	Input Low Volt.	4.75 V	1.18	1.18	1.18	0.0		0.80	V
IIL	Vin= 0 V	5.25 V	-95.7	-12.4	65.32	39.8	-1u	1 u	nA
IIH	Vin= 5.25 V	5.25 V	-64.45	40.76	112.26	49.59		1 u	nA
IOZL	Vout= 0 V	5.25 V	-81.55	-26.5	17.24	22.86		1 u	nA
IOZH	Vout= 5.25V	5.25 V	-45.46	14.27	90.96	36.84		1 u	nA
VIK	Iin=-18mA, A pin or /BE	4.75 V 4.75V	-1.21 -1.79	-1.1 -1.75	-1.06 -1.72	0.002 0.003		-1.2	V
ICC	Vin=0V	5.25 V	42.44	45.34	47.31	1.08	-1	100	µA
ΔICC	Vin=3.4V	5.25 V	0.467	0.510	0.547	0.0182		2.5	mA
Ron	Vin=0.0V, Ion =48mA	4.75V	5.4	5.81	6.25	0.009	5	7	Ohm
Ron	Vin=2.4V, Ion =-15mA	4.75V	8	8.6	8.93	0.003	10	15	Ohm

Table 2. DC Characteristics, 25 Units, 25C –TESTER DATA

			CSMS				Specification		
Param.	**Test Conditions**	**Vcc**	**Min**	**Avg**	**max**	**Std Dev**	**Min**	**Max**	**Units**
VIH	Input High Volt.	4.75V	1.19	1.20	1.23	0.018	2.00		V
VIL	Input Low Volt.	4.75 V	1.18	1.18	1.18	0.0		0.80	V
IIL	Vin= 0 V	5.25 V	-64.45	-7.5	49.67	29.97	-1u	1 u	nA
IIH	Vin= 5.25 V	5.25 V	-64.45	28.99	143.55	56.15		1 u	nA
IOZL	Vout= 0 V	5.25 V	-27.57	-65.87	12.54	20.05		1 u	nA
IOZH	Vout= 5.25V	5.25 V	-45.46	18.16	90.96	38.77		1 u	nA
VIK	Iin=-18mA, A pin or /BE	4.75 V 4.75V	-1.17 -1.65	-1.12 -1.62	-1.08 1.61	0.023 0.017		-1.2	V
ICC	Vin=0V	5.25 V	48.58	52.73	55.84	1.95	-1	100	µA
ΔICC	Vin=3.4V	5.25 V	0.23	0.24	0.26	0.008		2.5	mA
Ron	Vin=0.0V, Ion =48mA	4.75V	6.4	6.7	7.43	0.012	5	7	Ω
Ron	Vin=2.4V, Ion =-15mA	4.75V	10	10.6	11.33	0.006	10	15	Ω

Table 3. DC Characteristics –BENCH DATA

			Hynix			Specification		
Para-meters	**Test Conditions**	**Vcc**	**-10°C**	**25°C**	**90°C**	**Min**	**Max**	**Units**
VIH	Input High Voltage	4.75V	1.42	1.40	1.38	2.0		V
VIH	Input High Voltage	5.00V	1.45	1.44	1.41	2.0		V
VIH	Input High Voltage	5.25V	1.48	1.47	1.44	2.0		V
VIL	Input Low Voltage	4.75V	1.54	1.53	1.50		0.8	V
VIL	Input Low Voltage	5.00V	1.58	1.57	1.54		0.8	V
VIL	Input Low Voltage	5.25V	1.61	1.59	1.56		0.8	V
VH	Input Hysteresis	4.75V	0.12	0.13	0.12	typ	0.15	V
VH	Input Hysteresis	5.00V	0.13	0.13	0.13	typ	0.15	V
VH	Input Hysteresis	5.25V	0.13	0.12	0.12	typ	0.15	V
IIL	Vin = 0V	5.25V	-153p	-61.5p	74.5p		-1u	A
IIH	Vin = 5.25V	5.25V	98.3p	143p	186p		1u	A
IOZL	Vout = 0V	5.25V	207p	66.2p	341p		-1u	A
IOZH	Vout = 5.25V	5.25V	-178p	206p	302p		1u	A
ICCL	Vin = 0V	5.25V	50.81	45.80	36.71		100	µA
ICCH	Vin = 5.25V	5.25V	50.86	45.93	36.67		100	µA
ΔICC	Vin = 3.4V	5.25V	0.53	0.51	0.50		2.5	mA
Ron	Ion = 48mA, Vin = 0V	4.75V	3.67	4.56	4.96		7	Ω
Ron	Ion = 15mA, Vin = 2.4V	4.75V	6.53	7.86	9.20		15	Ω

Table 4: Ron Measurement, all paths, Vcc=4.75V, 25C –BENCH DATA

	Hynix		CSMS		
Channel	**Ion=48mA Vin=0V**	**Ion=15mA Vin=2.4V**	**Ion=48mA Vin=0V**	**Ion=15mA Vin=2.4V**	**Units**
A0-B0	4.29	7.53	4.90	7.60	Ω
A1-B1	4.10	7.40	4.75	7.47	Ω
A2-B2	4.33	7.60	4.75	7.40	Ω
A3-B3	4.23	7.53	4.75	7.33	Ω
A4-B4	4.29	7.40	4.73	7.47	Ω
A5-B5	4.02	7.20	4.77	7.40	Ω
A6-B6	4.56	7.86	4.71	7.33	Ω
A7-B7	4.08	7.33	4.73	7.26	Ω
A8-B8	4.21	7.40	4.79	7.40	Ω
A9-B9	4.40	7.47	4.87	7.60	Ω

Table 5. Capacitance at 25C –BENCH DATA

Symbol	**Description**	**Vcc**	**Hynix**	**CSMS**	**Typ**	**Units**
Cin	Control Input	5 V	3.5	3.3	6	pF
Coff	A Cap, Switch Off	5 V	4.1	3.8	6	pF
Coff	B Cap, Switch Off	5 V	4.1	4.0	6	pF
Con	A-B, Switch On	5 V	6.7	8.4	8	pF

HP4285A LCR Meter

Table 6. AC Characteristics –BENCH DATA

			Hynix			CSMS				
Symbol	**Vcc**	**Load**	**-10°C**	**25°C**	**90°C**	**-10°C**	**25°C**	**90°C**	**Max Spec**	**Units**
TpZH	4.75 V	Load A	2.24	2.30	2.45	3.02	3.17	3.47	6.5	ns
TpHZ	4.75 V	Load A	2.90	2.91	2.91	3.43	3.49	3.60	5.5	ns
TpZL	4.75 V	Load B	2.41	2.50	2.68	3.20	3.38	3.39	6.5	ns
TpLZ	4.75 V	Load B	2.39	2.48	2.83	3.12	3.23	3.71	5.5	ns

Load A: 50pF//500Ω

Load B: 50pF//500Ω, 500Ω to 2Vcc

Table 7. Dynamic Icc, Vcc=5.25V, 25C –BENCH DATA

Frequency	**Hynix**	**CSMS**	**Units**
0 MHz	0.0472	0.0558	mA
1MHz	0.110	0.130	mA
5MHz	0.362	0.430	mA
10MHz	0.685	0.804	mA
20MHz	1.292	1.551	mA

Undershoot Protection Test Procedure

1. Switch is disabled with /BE=Vcc.
2. Pin B has a 10kΩ pull-up to Vcc.
3. HP8116A Pulse Generator provides undershoot signal to pin A. Undershoot signal is from 3V to –0.8, -0.9, -1.0 or –1.1V with pulse width 10, 15, 20 or 25ns.
4. TDS8000 Oscilloscope with active probe is used to monitor and measure induced glitch at pin B.
5. HP8116A Pulse Generator is programmed with a narrow undershoot pulse of 25ns but actual pulse width at the narrow end is about 18ns.

Table 8: Undershoot Protection Test, Vcc=5V –BENCH DATA

		Hynix		CSMS	
Negative Signal	**Pulse Width**	**Min (Dip)**	**VOH (Flat Line)**	**Min (Dip)**	**VOH (Flat Line)**
-0.8V	10ns	3.00V	3.29V	2.96V	3.30V
-0.8V	15ns	2.86V	3.29V	2.95V	3.30V
-0.8V	20ns	2.84V	3.29V	2.95V	3.30V
-0.8V	25ns	2.84V	3.29V	2.95V	3.30V
-0.9V	10ns	2.99V	3.29V	2.95V	3.29V
-0.9V	15ns	2.34V	3.29V	2.75V	3.29V
-0.9V	20ns	2.22V	3.29V	2.69V	3.29V
-0.9V	25ns	2.23V	3.29V	2.73V	3.29V
-1.0V	10ns	2.99V	3.29V	2.94V	3.29V
-1.0V	15ns	1.54V	3.29V	2.26V	3.29V
-1.0V	20ns	1.25V	3.29V	2.03V	3.29V
-1.0V	25ns	1.29V	3.29V	2.04V	3.29V
-1.1V	10ns	2.87V	3.29V	2.92V	3.30V
-1.1V	15ns	0.59V	3.27V	1.59V	3.29V
-1.1V	20ns	0.11V	3.27V	1.07V	3.29V
-1.1V	25ns	0.14V	3.27V	0.94V	3.29V