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

PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN Number: **06-04**

Date Issued: **June 30, 2006**

Product(s) Affected: **PI7C8150A, 8150A-33, 8150B, 8150B-33, PI7C8152A, 8152B**

Manufacturing Location Affected: **TSMC Fab 7 and 10**

Date Effective: **September 30, 2006 – standard 90 day waiting period.**

Means of Distinguishing Changed Devices:

☐ Product Mark:

☐ Back Mark

☒ Date Code: ***B letter code as first character**

☐ Other

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Attachment: ☒ Yes; ☐ No

Characterization data by confirmed TSMC-Fab 10 devices have no critical performance differences from TSMS Fab 7 production. See attached Characterization Comparison Data starting on page 3 of this document.

Samples: **Request from Pericom Sales.**

Description and Purpose of Change:

This product has been transferred from wafer fab subcontractor Taiwan Semiconductor Manufacturing Corp. (TSMC) Fab 7 (which closed operations during Q-1, 2006, to their Fab 10 facility in Shanghai, China. The devices are being manufactured from the same die array, and will retain the same die size and CMOS, 0.35-µm, 1P4M process as used in TSMC Fab 7. Key TSMC wafer fab manufacturing equipment was transferred to Fab 10, and Pericom is using the same mask set. See the TSMC-website for more information about the China Fab operation:

http://www.tsmc.com/download/english/a05_literature/enliterature/html-newsletter/Dec2004/ManufacturingExcellence/index.html

☐ Die Technology

☒ Wafer Fabrication

☐ Assembly Process

☐ Equipment

☐ Material

☐ Testing

☒ Manufacturing Site

☐ Data Sheet

☒ Other: Class 2 change

Reliability/Qualification Summary: **Process Qualification report for Fab 10 is on page 2 of this document**

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
www.pericom.com

Date: June 20, 2006

Subject: ***TSMC Wafer Fab 10 - 0.35 μm CMOS (1P4M) Process Qualification Report***

A sample of 112 units from a lot of PI7C8150B PCI Bridge device type manufactured at TSMC's Fab 10 facility successfully completed Dynamic High Temperature Operating Life (DHTOL) test with no failures. This device and others in the PCI- Bridge family of products are now being manufactured at our wafer fabrication subcontract supplier, TSMC (http://www.tsmc.com/english/default.htm) in their Fab 10 facility near Shanghai, China. This is because they closed their Fab 7 facility last quarter, which is where they were previously manufactured. The product still uses the same 0.35-μm CMOS, 3.3-volt, Single Poly, Quad Metal (1P4M) process. Therefore, this device type and others in the product family that use this process meet Pericom's initial Fab Process Qualification sampling plan requirement. The device also passed ESD and Latch-up characterization test evaluation per the JEDEC test standards. The results are indicated in the table below.

The equivalent FIT rate for just 1000 hours of DHTOL is currently 293.0 for any device using the same process and design rules, with an MTBF of 6,218,218 hours. 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 Level factor of 60%. This number will lower significantly as we continue the DHTOL testing to a total of 3000 hours. The 2000-hour readout will be available in late July, 2006.

Pericom's Process Qualification Test results to date:

Rel Lot #	Device Type	Pkg. Type	Date Code	Stress Test	Sample Units	Test Conditions (Per JEDEC Standards)	Stress/ Duration	Results Pass/Fail
QDT06002-1	PI7C8150B	NA-256	B0610BT	DHTOL	112	+125 °C, 3.6 V	168 hrs	112/0
							500 hrs	112/0
							1000 hrs	112/0
							2000 hrs	In process
							3000 hrs	
N/A	PI7C8150B	NA-256		Latch-up	6	EIA/JESD78	>±200mA	6/0
N/A	PI7C8150B	NA-256		ESD-HBM	5	JESD22-A114-B	>2000V	5/0
N/A	PI7C8150B	NA-256		ESD-MM	5	JESD22-A115-A	>200V	5/0

Generically equivalent Pericom products that use the same array, design rules and process technology can also be considered qualified by this product. This will also include: **PI7C8150A, 7C8150A-33, 7C8150B-33, 7C8150D, 7C8152A and 7C8152B**

If there are any questions about this qualification report, please contact me as indicated below.

Regards,

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Subject: PI7C8150B TSMC Fab7 versus Fab10 Characterization Comparison Report

Introduction
Material from TSMC Fab10 and Fab7 are compared in side-by-side measurements. This characterization exercise is intended for electrical parameter qualification of the wafer fabrication transfer from Fab 7 to Fab 10.

Reference
Fab Process: TSMC 0.35um 3.3, 1P4M Silicide CMOS process
Lot#: R61261, *D/C:* 0322BT (Fab 7 Material)
Lot#: H60175.1, *D/C:* B0610BT (Fab 10 Material)

Equipment Used
HP83K ATE
Parametric Analyzer HP4146B

Tabulated Test Summary
Table 1: Output delay measurements, VCC=3.3V, 25C and 85C
Table 2: Hold time measurements, VCC=3.3V, 25C and 85C
Table 3: Setup time measurements, VCC=3.3V, 25C and 85C
Table 4: Fab7 VOL output drive
Table 5: Fab10 VOL output drive
Table 6: Fab7 VOH output drive
Table 7: Fab10 VOH output drive

Output Plots (25C, VCC=3.0V, 3.3V, 3.6V)
Plot 1: Fab10 VOH plot, normal drive selection
Plot 2: Fab10 VOH plot, high drive selection
Plot 3: Fab10 VOL plot, normal drive selection
Plot 4: Fab10 VOL plot, high drive selection
Plot 5: Fab7 VOH plot, normal drive selection
Plot 6: Fab7 VOH plot, high drive selection
Plot 7: Fab7 VOL plot, normal drive selection
Plot 8: Fab7 VOL plot, high drive selection

Conclusion

Both wafer fab versions meets the datasheet specifications for timing requirements.

Table 1: Output delays measurement at VCC=3.3V

Pin	Fab-7				Fab-10			
	25C		85C		25C		85C	
	min (ns)	max (ns)	min (ns)	max (ns)	min (ns)	max (ns)	min (ns)	max (ns)
P_AD[31:0]	4.12	4.80	4.33	5.19	3.61	4.15	3.91	4.46
P_CBE[3:0]	4.17	4.40	4.36	4.76	3.68	4.03	3.96	4.16
P_SERR_L	3.39	3.52	3.57	3.78	3.03	3.10	3.25	3.32
P_DEVSEL_L	4.44	4.60	4.65	4.91	3.96	4.04	4.19	4.27
P_FRAME_L	4.28	4.42	4.49	4.75	3.78	3.90	4.05	4.15
P_IRDY_L	4.48	4.60	4.69	4.96	3.97	4.06	4.26	4.34
P_PAR	4.21	4.34	4.40	4.66	3.75	3.82	3.99	4.06
P_PERR_L	4.27	4.41	4.50	4.75	3.82	3.87	4.09	4.15
P_STOP_L	4.49	4.68	4.73	4.98	4.04	4.07	4.29	4.35
P_TRDY_L	4.35	4.51	4.52	4.81	3.84	3.96	4.09	4.19
S_AD[31:0]	4.01	4.79	4.23	5.17	3.61	4.15	3.80	4.34
S_CBE[3:0]	4.06	4.51	4.28	4.84	3.68	4.03	3.87	4.10
S_RESET_L	5.57	6.00	5.90	6.50	4.85	4.95	5.16	5.27
S_DEVSEL_L	4.34	4.69	4.58	5.04	3.87	3.93	4.10	4.23
S_FRAME_L	4.02	4.39	4.23	4.73	3.61	3.65	3.84	3.94
S_IRDY_L	4.31	4.67	4.51	5.03	3.84	3.90	4.07	4.19
S_LOCK_L	4.17	4.48	4.39	4.82	3.74	3.77	3.93	4.06
S_PAR	5.37	5.76	5.67	6.22	4.81	4.91	5.13	5.29
S_PERR_L	4.10	4.42	4.29	4.76	3.66	3.73	3.87	4.01
S_STOP_L	4.35	4.71	4.57	5.05	3.89	3.96	4.12	4.25
S_TRDY_L	4.36	4.71	4.57	5.04	3.88	3.94	4.10	4.23
S_CLKOUT[9:0]	3.77	4.25	3.99	4.56	3.31	3.60	3.55	3.82
S_GNT_L[8:0]	4.94	5.66	5.24	6.11	4.36	4.83	4.65	5.17

Table 2: Hold Time measurement at VCC=3.3V

Pin	Fab-7				Fab-10			
	25C		85C		25C		85C	
	min (ns)	max (ns)	min (ns)	max (ns)	min (ns)	max (ns)	min (ns)	max (ns)
P_AD[31:0]	-0.86	-0.20	-0.98	-0.24	-0.87	-0.30	-1.00	-0.34
P_CBE[3:0]	-0.60	-0.37	-0.66	-0.42	-0.67	-0.44	-0.72	-0.50
P_GNT_L	-0.17	-0.14	-0.21	-0.15	-0.17	-0.15	-0.19	-0.18
P_IDSEL	-0.81	-0.77	-0.86	-0.82	-0.78	-0.73	-0.81	-0.75
P_DEVSEL_L	-0.36	-0.32	-0.40	-0.35	-0.46	-0.40	-0.48	-0.42
P_FRAME_L	-0.41	-0.39	-0.45	-0.42	-0.41	0.41	-0.45	-0.41
P_IRDY_L	-0.27	-0.22	-0.28	-0.25	-0.28	-0.25	-0.30	-0.27
P_PAR	-0.26	-0.17	-0.19	-0.13	-0.20	-0.14	-0.16	-0.13
P_PERR_L	-0.43	-0.37	-0.49	-0.43	-0.53	-0.46	-0.58	-0.51
P_STOP_L	-0.42	-0.37	-0.42	-0.40	-0.43	-0.39	-0.45	-0.41
P_TRDY_L	-0.17	-0.14	-0.15	-0.11	-0.21	-0.19	-0.18	-0.15
S_AD[31:0]	-0.94	-0.39	-1.06	-0.44	-0.98	-0.38	-1.11	-0.40
S_CBE[3:0]	-0.88	-0.67	-1.06	-0.44	-0.95	-0.74	-1.04	-0.83
S_DEVSEL_L	-0.71	-0.69	-0.81	-0.78	-0.78	-0.73	-0.88	-0.82
S_FRAME_L	-0.46	-0.39	-0.47	-0.41	-0.41	-0.39	-0.43	-0.39
S_IRDY_L	-0.36	-0.32	-0.36	-0.33	-0.35	-0.32	-0.36	-0.34
S_PAR	-0.53	-0.49	-0.58	-0.55	-0.49	-0.46	-0.54	-0.47
S_PERR_L	-0.85	-0.84	-0.97	-0.93	-0.93	-0.87	-1.04	-0.93
S_STOP_L	-0.47	-0.42	-0.47	-0.43	-0.49	-0.45	-0.49	-0.43
S_TRDY_L	-0.32	-0.28	-0.32	-0.28	-0.33	-0.30	-0.32	-0.28
S_REQ_L	-1.86	-0.63	-2.20	-0.68	-1.66	-0.56	-1.80	-0.58

Note: negative measurement showing timing edge before clock edge

Table 3: Setup time measurement result s, VCC=3.3V

Pin	Fab-7				Fab-10			
	25C		85C		25C		85C	
	min (ns)	max (ns)	min (ns)	max (ns)	min (ns)	max (ns)	min (ns)	max (ns)
P_AD[31:0]	-1.93	-0.97	-2.07	-1.03	-1.95	-1.02	-2.09	-1.08
P_CBE[3:0]	-1.44	-1.30	-1.51	-1.37	-1.52	-1.31	-1.60	-1.42
P_GNT_L	-0.99	-0.96	-1.08	-1.06	-0.92	-0.90	-0.98	-0.97
P_IDSEL	-0.57	-0.54	-0.62	-0.59	-0.55	-0.51	-0.61	-0.55
P_DEVSEL_L	-0.49	-0.44	-0.54	-0.49	-0.57	-0.53	-0.62	-0.56
P_FRAME_L	-1.08	-1.04	-1.16	-1.13	-1.05	-1.00	-1.16	-1.08
P_IRDY_L	-1.07	-1.04	-1.17	-1.12	-1.00	-1.00	-1.10	-1.06
P_PAR	-1.65	-1.60	-1.72	-1.63	-1.59	-1.55	-1.60	-1.56
P_PERR_L	-0.76	-0.72	-0.85	-0.82	-0.83	-0.77	-0.93	-0.85
P_STOP_L	-1.31	-1.21	-1.37	-1.31	-1.28	-1.14	-1.29	-1.22
P_TRDY_L	-1.30	-1.22	-1.35	-1.29	-1.24	-1.16	-1.23	-1.19
S_AD[31:0]	-2.18	-1.18	-2.31	-1.21	-2.23	-1.14	-2.27	-1.16
S_CBE[3:0]	-2.04	-1.72	-2.12	-1.83	-2.06	-1.74	-2.16	-1.83
S_DEVSEL_L	-0.83	-0.80	-0.95	-0.91	-0.91	-0.85	-1.04	-0.96
S_FRAME_L	-1.15	-1.10	-1.27	-1.23	-1.19	-1.15	-1.33	-1.26
S_IRDY_L	-1.33	-1.26	-1.43	-1.33	-1.23	-1.19	-1.31	-1.26
S_PAR	-2.08	-2.02	-2.16	-2.09	-2.04	-2.01	-2.18	-2.08
S_PERR_L	-1.24	-1.21	-1.39	-1.35	-1.28	-1.23	-1.44	-1.34
S_STOP_L	-1.17	-1.10	-1.23	-1.17	-1.13	-1.10	-1.27	-1.20
S_TRDY_L	-1.47	-1.34	-1.59	-1.44	-1.37	-1.33	-1.47	-1.40
S_REQ_L	-2.14	-1.31	-2.37	-1.43	-1.95	-1.19	-2.14	-1.28

Note: negative measurement showing timing edge before clock edge

Table 4: Fab7 VOL output drive, 25C

	Normal Drive Selection			High Drive Selection			
VOL(V)	**VCC=3.0V**	**VCC=3.3V**	**VCC=3.6V**	**VCC=3.0V**	**VCC=3.3V**	**VCC=3.6V**	**units**
0.5	41.8	44.0	45.6	51.2	53.6	55.6	mA
1.0	74.8	80.3	84.4	91.8	98.0	103.2	mA
1.5	95.1	105.4	113.1	117.3	129.0	138.9	mA
2.0	102.1	116.9	129.6	126.5	144.1	159.8	mA
2.5	102.9	119.3	134.7	127.6	147.2	166.9	mA
3.0	102.9	119.3	135.2	127.6	147.2	167.3	mA
3.3		119.3	135.2		147.2	167.3	mA

Table 5: Fab10 VOL output drive, 25C

	Normal Drive Selection			High Drive Selection			
VOL(V)	**VCC=3.0V**	**VCC=3.3V**	**VCC=3.6V**	**VCC=3.0V**	**VCC=3.3V**	**VCC=3.6V**	**units**
0.5	41.1	43.1	44.6	58.6	61.6	63.8	mA
1.0	74.4	79.4	83.4	90.2	96.4	100.7	mA
1.5	96.1	105.6	113.3	117.5	123.1	137.6	mA
2.0	104.5	113.1	131.7	128.7	147.0	161.3	mA
2.5	105.7	122.5	138.6	130.4	151.8	170.8	mA
3.0	105.7	122.6	139.4	130.4	151.9	172.0	mA
3.3		122.6	139.4		151.9	172.0	mA

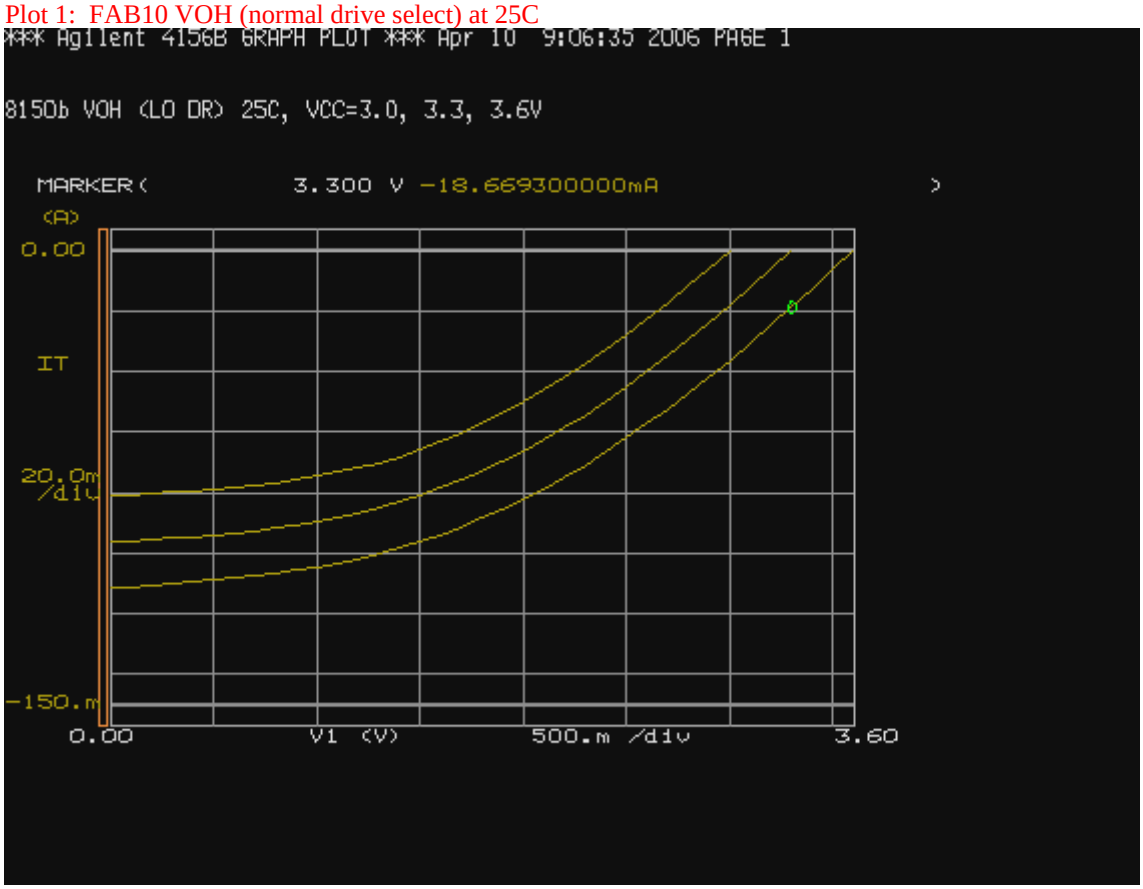
Table 6: Fab7 VOH output drive, 25C

	Normal Drive Selection			High Drive Selection			
VOH(V)	**VCC=3.0V**	**VCC=3.3V**	**VCC=3.6V**	**VCC=3.0V**	**VCC=3.3V**	**VCC=3.6V**	**units**
0.0	-74.4	-88.1	-102.1	-89.7	-106.8	-123.4	mA
0.5	-72.4	-86.0	-99.9	-87.5	-104.4	-121.0	mA
1.0	-68.8	-82.2	-96.1	-83.2	-100.1	-116.5	mA
1.5	-60.7	-74.5	-88.6	-73.5	-90.7	-107.4	mA
2.0	-46.3	-60.8	-75.7	-55.9	-74.0	-91.7	mA
2.5	-25.5	-41.2	-57.2	-30.9	-50.2	-69.1	mA
3.0	0.0	-16.3	-33.5	0.0	-20.2	-40.4	mA
3.3		0.0	-17.2		0.0	-20.8	mA

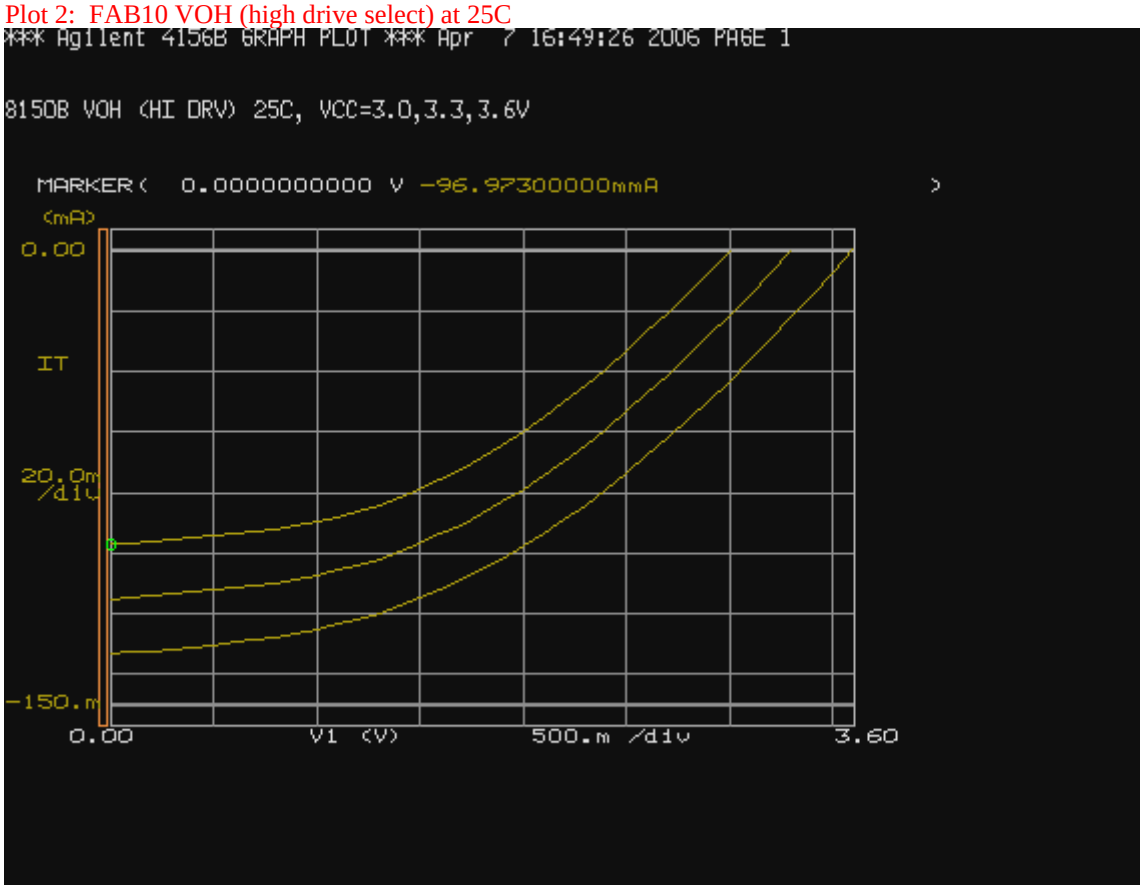
Table 7: Fab10 VOH output drive, 25C

	Normal Drive Selection			High Drive Selection			
VOH(V)	**VCC=3.0V**	**VCC=3.3V**	**VCC=3.6V**	**VCC=3.0V**	**VCC=3.3V**	**VCC=3.6V**	**units**
0.0	-81.1	-96.5	-111.7	-97.0	-115.2	-133.4	mA
0.5	-78.8	-94.0	-109.1	-94.4	-112.4	-130.5	mA
1.0	-74.6	-89.7	-104.7	-89.5	-107.4	-125.2	mA
1.5	-65.7	-81.0	-96.2	-78.9	-98.9	-115.0	mA
2.0	-50.1	-66.2	-82.2	-59.8	-78.8	-97.9	mA
2.5	-27.6	-44.8	-62.0	-33.0	-53.2	-73.5	mA
3.0	0.0	-18.0	-36.3	0.0	-20.2	-42.9	mA
3.3		0.0	--18.7		0.0	-22.0	mA

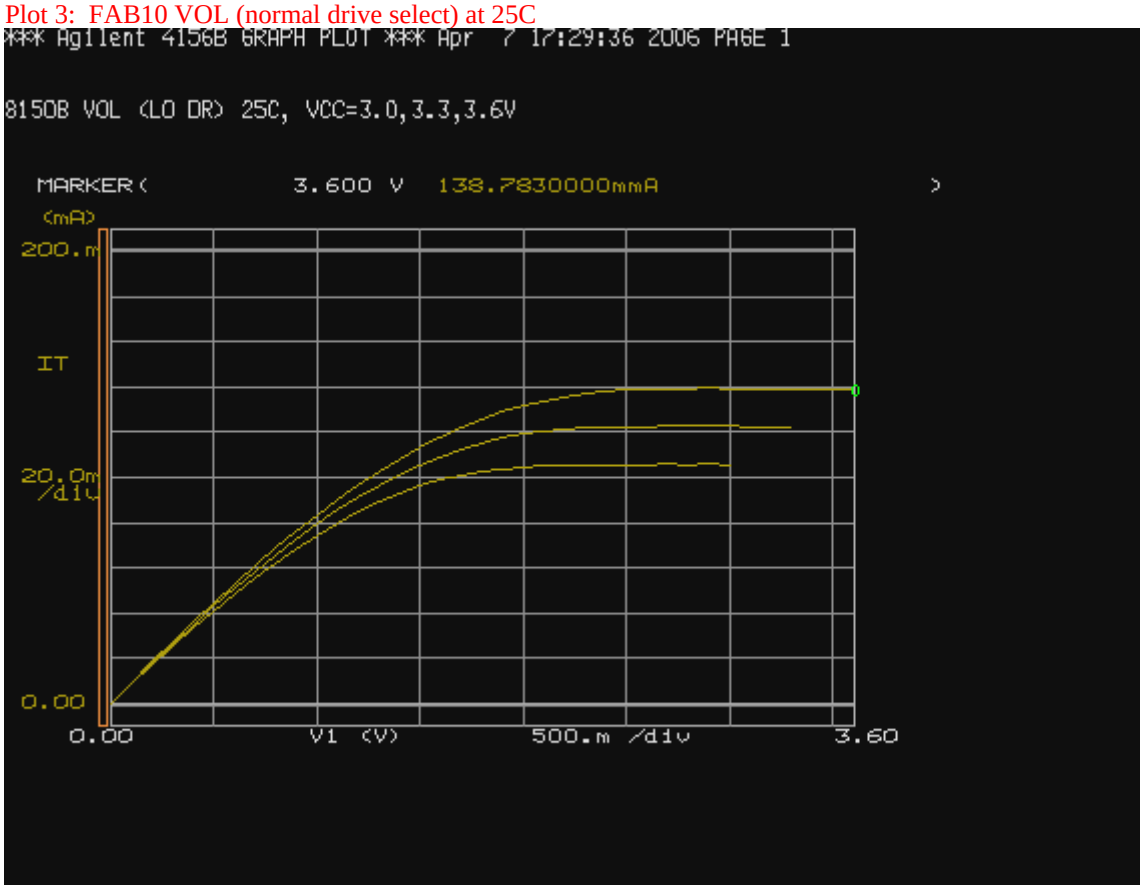
Plot 1: FAB10 VOH (normal drive select) at 25C



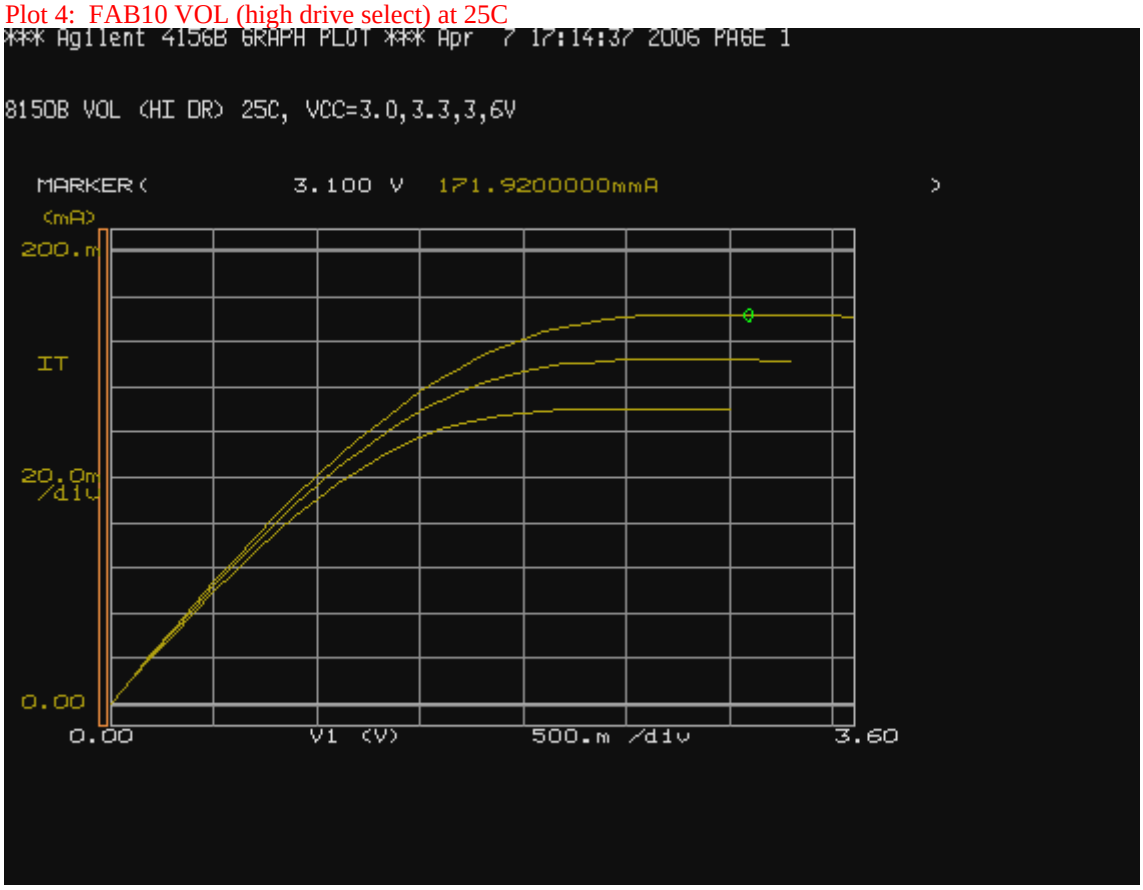
Plot 2: FAB10 VOH (high drive select) at 25C



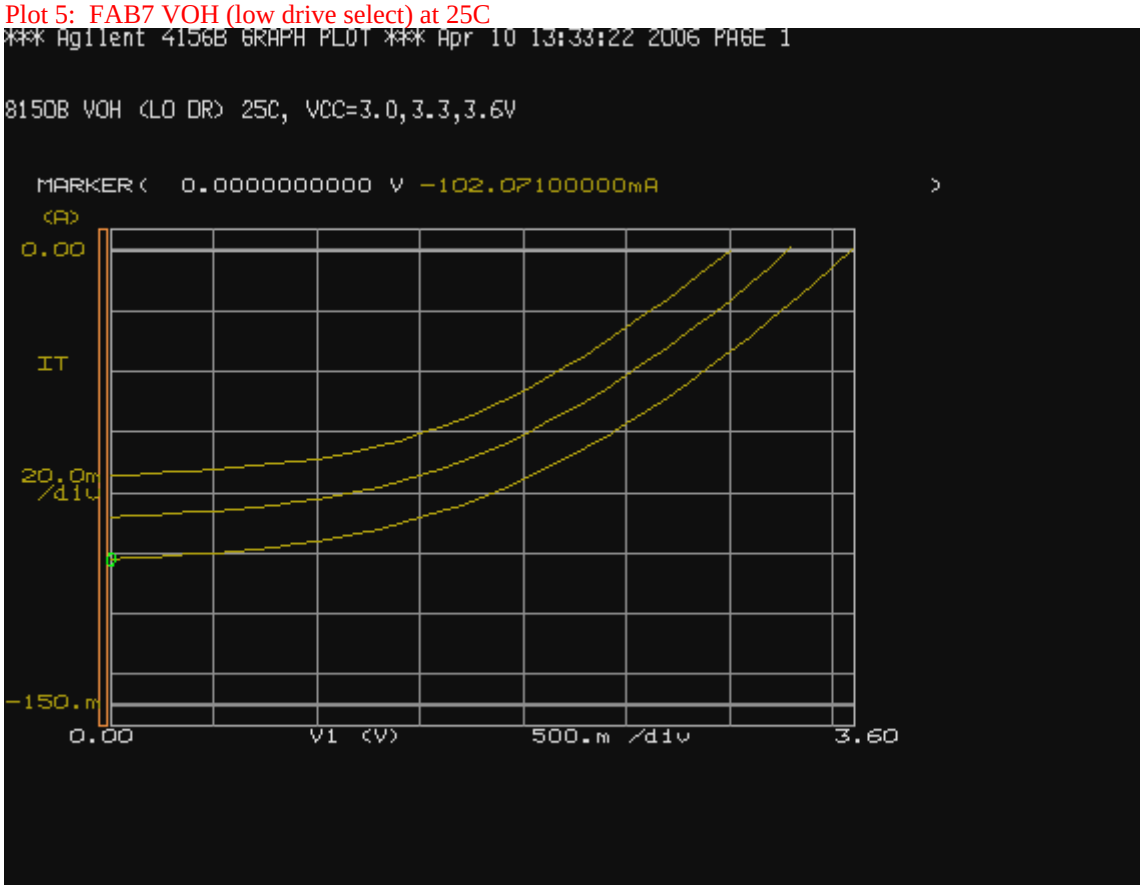
Plot 3: FAB10 VOL (normal drive select) at 25C



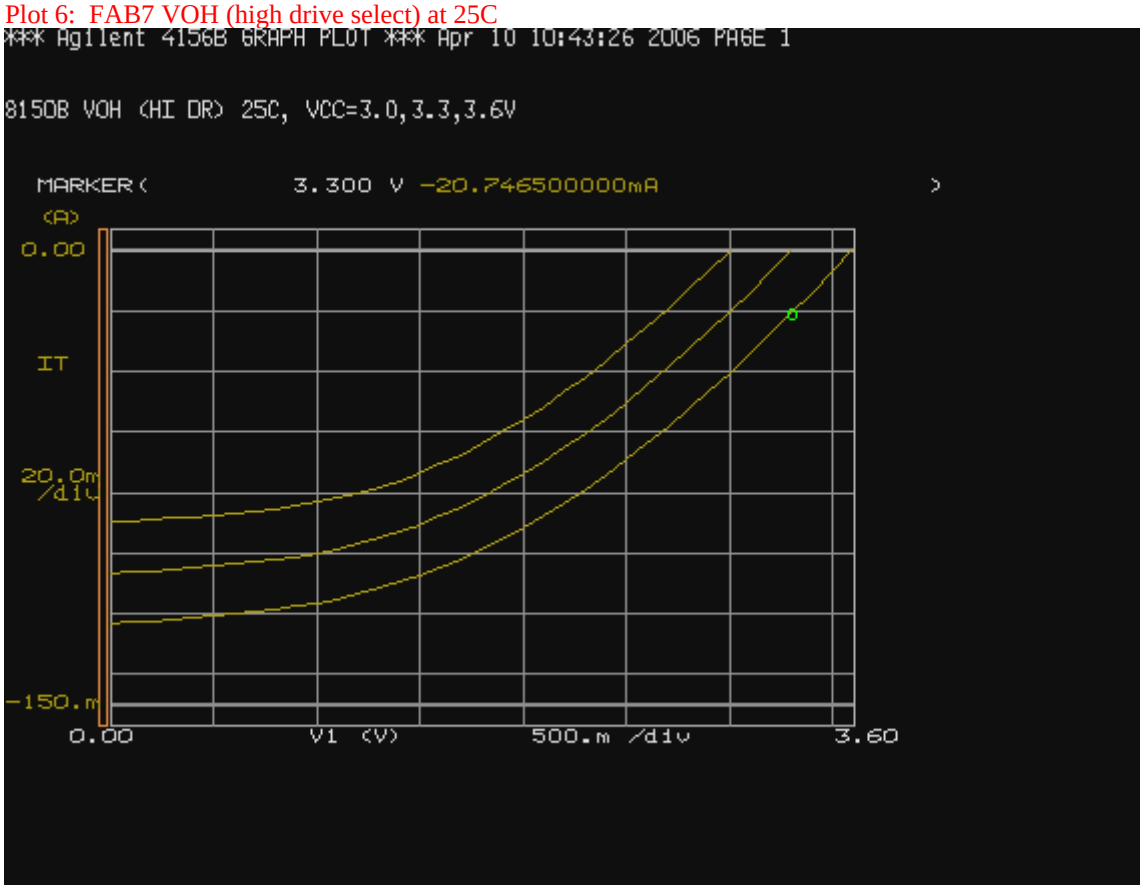
Plot 4: FAB10 VOL (high drive select) at 25C



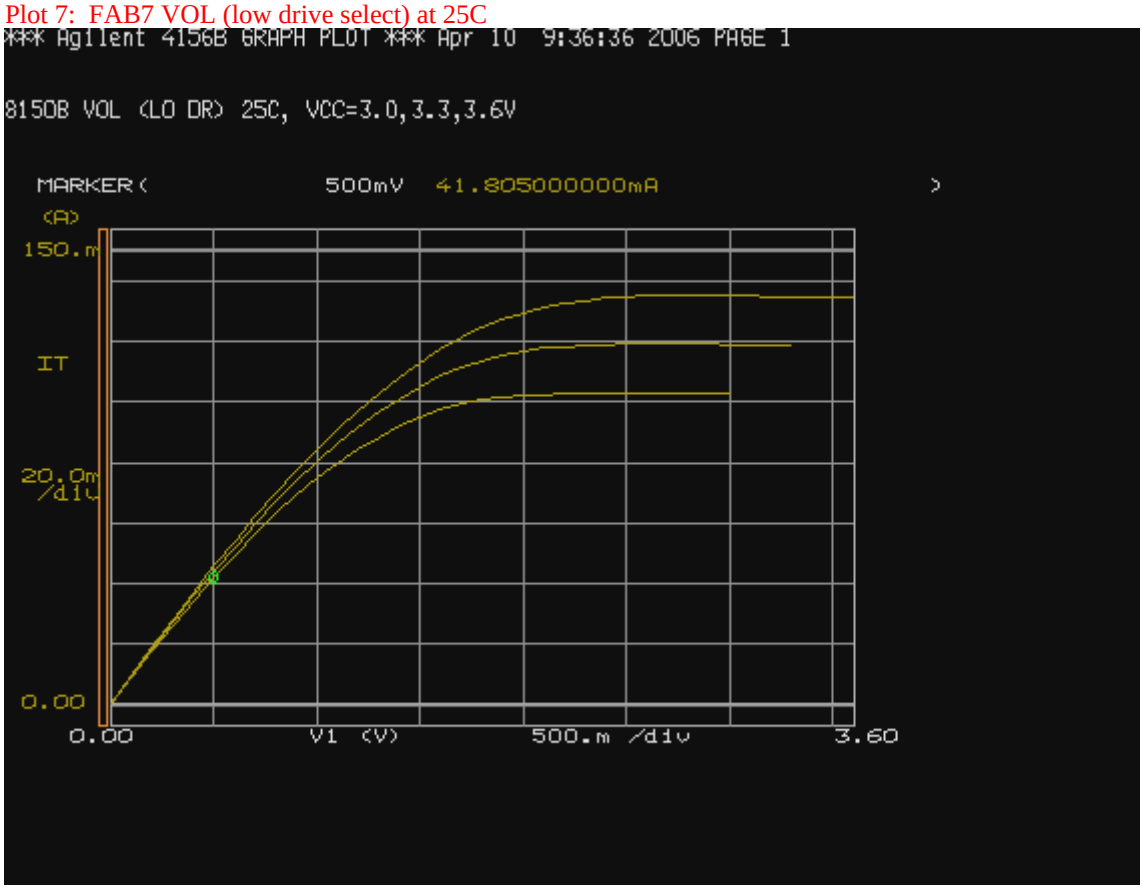
Plot 5: FAB7 VOH (low drive select) at 25C



Plot 6: FAB7 VOH (high drive select) at 25C



Plot 7: FAB7 VOL (low drive select) at 25C



Plot 8: FAB7 VOL (high drive select) at 25C