Cypress Semiconductor
Product Qualification Report

QTP# 043001 VERSION 1.0
July 2005

FastEdge ™ Series **B55SGT Technology, Fab 4**	
CY2PP318	**1 of 2:8 Differential Clock/Data Fanout Buffer**

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

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PACKAGE QUALIFICATION HISTORY

QUAL REPORT	DESCRIPTION OF QUALIFICATION PURPOSE	DATE COMP.
015104	New Technology B55SGT18A using New Device, CY2DP3110A1 HF Buffer Family	May 03
024307	7B8P3110AC HF Buffer Family, 55SGT18A from Fab4	Nov 03
043001	(CY2PP318) New Mask Option from 7B83110 using B55SG Technology from Fab4	Apr 05

PRODUCT DESCRIPTION (for qualification)	
Qualification Purpose: New Device (CY2PP318) Mask Option of 7B83110AC Base die, B55SG Technology, Fab4	
Marketing Part #:	CY2PP318
Device Description:	FastEdge™ Series 1 of 2:8 Differential Clock/Data Fanout Buffer
Cypress Division:	Consumer & Computation Division (CCD)
Overall Die (or Mask) REV Level (prerequisite for qualification):	REV. A
What ID markings on Die:	7B8318A/7B83118B

TECHNOLOGY/FAB PROCESS DESCRIPTION – B55STG		
Number of Metal Layers: 3	Metal Composition	M1: 500Å TiW / 6000Å Al / 500Å TiW M2: 500Å TiW / 8000Å Al / 500Å TiW M3: 500Å TiW / 40,000Å Al / 300Å TiW
Passivation Type and Materials:	4000Å TEOS / 9000Å Si3N4	
Free Phosphorus contents in top glass layer (%):	0%	
Number of Transistors in Device	Maximum Available in Base: 100,000 Transistors Average Design: 60,000 Transistors	
Number of Gates in Device:	Maximum Available: 25,000 Average design: 15,000	
Generic Process Technology/Design Rule (μ-drawn)	CMOS (0.21 – 0.35 μm), SiGe Bipolar	
Gate Oxide Material/Thickness (MOS):	SiO2, 45Å	
Bipolar Isolation	STI	
Base/Emitter	SiGe / N+ Poly	
Name/Location of Die Fab (prime) Facility:	Cypress Semiconductor – Bloomington, MN (CMI)	
Die Fab Line ID/ Wafer Process ID:	Fab 4/ B55SGT	

PACKAGE AVAILABILITY

PACKAGE	ASSEMBLY SITE FACILITY
28-Pin PLCC	Amkor-Phil (PHIL-M)

Note: Package Qualification details are available upon request.

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	J28
Package Outline, Type, or Name:	28-Pin Plastic Leaded Chip Carriers (PLCC)
Mold Compound Name/Manufacturer:	Nitto MP8000
Mold Compound Flammability Rating:	V-O per UL94
Oxygen Rating Index:	>28%
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	SnPb
Die Backside Preparation Method/Metallization:	Grinding
Die Separation Method:	Saw
Die Attach Supplier:	Ablestik
Die Attach Material:	8361
Die Attach Method:	Epoxy
Bond Diagram Designation	10-05125
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au 1.0 mil
Thermal Resistance Theta JA °C/W:	57 °C/W
Package Cross Section Yes/No:	N/A
Assembly Process Flow:	49-24016
Name/Location of Assembly (prime) facility:	Amkor-Phil (PHIL-M)

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	Cypress Philippines (CML-R)
Fault Coverage:	96%

Note: Please contact a Cypress Representative for availability of other packages.

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V JESD22, Method A114-B	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V MIL-STD-883, Method 3015.7	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V Cypress Spec. 25-00020	P
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65 °C to 150 °C Precondition: JESD22 Moisture Sensitivity MSL-5 72 Hrs, 30°C/60 %RH+3IR-Reflow, 220 °C+0, -5 °C Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30°C/60 %RH+3IR-Reflow, 235 °C+0, -5 °C	P
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc Max = 3.8V, 125 °C	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc Max = 3.8V, 125°C	P
Pressure Cooker	121°C, 100 %RH Precondition: JESD22 Moisture Sensitivity MSL 5 72 Hrs, 30°C/60 %RH+3IR-Reflow, 220 °C+0, -5°C Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30°C/60 %RH+3IR-Reflow, 235 °C+0, -5°C	P
High Accelerated Saturation	130C, 2.75V/3.08V, 85% RH Precondition: JESD22 Moisture Sensitivity MSL 5 72 Hrs, 30°C/60 %RH+3IR-Reflow, 220 °C+0, -5°C	P
Aged Bond Strength	200°C, 4 Hrs MIL-STD-833, Method 883-2011	P
Static Latch up	125°C, 9.5V/10V, ± 300 mA In accordance with JEDEC 17. Cypress Spec. 01-00081	P
Acoustic Microscopy	Cypress Spec. 25-00104	P
High Temperature Storage	150°C, ± 5 °C, No Bias	P

RELIABILITY FAILURE RATE SUMMARY

Stress/Test	**Device Tested/ Device Hours**	**# Fails**	Activation Energy	**Thermal AF[4]**	**Failure Rate**
High Temperature Operating Life Early Failure Rate[1]	2,853 Devices	0	N/A	N/A	0 PPM
High Temperature Operating Life[1,2] Long Term Failure Rate	747,872 DHRs	0	0.70	55	22 FITs

[1] The product does not require a production burn-in.
[2] An ambient temperature of 55 ºC and a junction temperature rise of 15 ºC are assumed.
[3] Chi-squared 60% estimations are used to calculate the failure rate.
[4] Thermal Acceleration Factor is calculated from the Arrhenius equation…

$$AF = \exp\left[\frac{E_A}{k}\left[\frac{1}{T_2} - \frac{1}{T_1}\right]\right]$$

where:

E_A = The activation energy of the defect mechanism.
k = Boltzman's Constant = 8.62×10^{-5} eV/Kelvin
T_1 = The junction temperature of the device under stress and T_2 = the junction temperature of the device at use conditions.

Reliability Test Data

QTP #: 015104

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC – MICROSCOPE MSL5							
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	COMP	15	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 2.8V, Vcc Max							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	96	630	0	
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	96663	0		
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	96	558	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 125C, 2.8V, Vcc Max							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	168	180	0	
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	500	179	0	
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	1000	177	0	
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	168	179	0	
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	500	178	0	
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	168	177	0	
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	500	175	0	
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	1000	173	0	
STRESS: HIGH TEMP STEADY STATE LIFE TEST, 150C, 2.75V, Vcc Max							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	8081	0		
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	168	80	0	
STRESS: LOW TEMPERATURE OPERATING LIFE, -30C, 2.80V							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	500	48	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 10.0V, +/300mA							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	COMP	3	0	
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	COMP	3	0	
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2,200V							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	COMP	3	0	
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	COMP	3	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	COMP	3	0	
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	COMP	3	0	
STRESS: AGE BOND STRENGTH							
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	COMP	6	0	
STRESS: HIGH TEMPERATURE STORAGE, PLASTIC, 150C, No Bias							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	500	48	0	

Reliability Test Data

QTP #: 015104

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: HI-ACCEL SATURATION TEST. 130C, 2.75V, 85%RH, PRE COND 72 HR 30C/60%RH, MSL 5							
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	128	45	0	
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	128	48	0	
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	256	47	0	
STRESS: HI-ACCEL SATURATION TEST. 130C, 3.08V, 85%RH, PRE COND 72 HR 30C/60%RH, MSL 5							
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	128	48	0	
STRESS: PRESSURE COOKER TEST, 121C, 100%RH, PRE COND 72 HR 30C/60%RH, MSL5							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	168	52	0	
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	168	48	0	
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	168	48	0	
CYS25G0102DX (7B95322A)	4225782	610248639/40/41	SEOL-L	288	48	0	
STRESS: TC COND. C -65C TO 150C, PRE COND 72 HRS 30C/60%RH, MSL5							
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	300	54	0	
CYS25G0102DX (7B95322A)	4221876	340200102/3/4	SEOL-L	500	54	0	
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	300	50	0	
CYS25G0102DX (7B95322A)	4222115	610243315/6/325	SEOL-L	500	50	0	

Reliability Test Data

QTP #: 024307

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC – MICROSCOPE MSL3							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	COMP	15	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 3.8V, Vcc Max							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	96	1002	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 125C, 3.8V, Vcc Max							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	168	180	0	
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	500	180	0	
CY2DP3140I (7B8314A)	4306669	610317907	PHIL-M	168	184	0	
CY2DP3140I (7B8314A)	4306669	610317907	PHIL-M	500	184	0	
CY2DP3140I (7B8314A)	4306669	610317907	PHIL-M	675	184	0	
STRESS: AGE BOND STRENGTH							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	COMP	5	0	
CY2DP3140I (7B8314A)	4306669	610317907	PHIL-M	COMP	4	0	
CY2PP326A1 (7B8326A)	4306670	610324358	KOREA-Q	COMP	30	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 10.0V, +/300mA							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	COMP	3	0	
CY2PP326A1 (7B8326A)	4306670	610324358	KOREA-Q	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2,200V							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	COMP	9	0	
CY2DP3140I (7B8314A)	4306669	610317907	PHIL-M	COMP	9	0	
CY2PP326A1 (7B8326A)	4306670	610324358	KOREA-Q	COMP	9	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	COMP	9	0	
CY2DP3140I (7B8314A)	4306669	610317907	PHIL-M	COMP	9	0	
CY2PP326A1 (7B8326A)	4306670	610324358	KOREA-Q	COMP	9	0	
STRESS: HIGH TEMPERATURE STORAGE, PLASTIC, 150C, No Bias							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	500	50	0	
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	1000	50	0	

Reliability Test Data

QTP #: 024307

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: PRESSURE COOKER TEST, 121C, 100%RH, PRE COND 192 HR 30C/60%RH, MSL3							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	168	50	0	
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	288	50	0	
STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3							
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	300	50	0	
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	500	49	0	
CY2DP3110AI (7B83110A)	4250487	610308689/90/1	KOREA-Q	1000	49	0	

Reliability Test Data

QTP #: 043001

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY2PP318JI (7B83118A)	4440208	610512943	PHIL-M	COMP	9	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B, 2,200V							
CY2PP318JI (7B83118A)	4440208	610512943	PHIL-M	COMP	9	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2,200V							
CY2PP318JI (7B83118A)	4440208	610512943	PHIL-M	COMP	3	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 9.5V, +/300mA							
CY2PP318JI (7B83118A)	4440208	610512943	PHIL-M	COMP	3	0	