Cypress Semiconductor
Qualification Report

QTP# 97328 VERSION 1.0
May, 1998

CY7C1334

64K x 32 Pipelined SRAM with NoBL™ Architecture
R42D Technology, Fab 4 Qualification

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CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

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PRODUCT DESCRIPTION (for qualification)	
Information provided in this document is intended for generic qualification and technically describes the Cypress part supplied:	
Marketing Part #:	CY7C1334
Package:	100-pin TQFP
Device Description:	64K x 32 Pipelined SRAM with NoBL Architecture, R42D Technology
Cypress Division:	Cypress Semiconductor Corporation – MPD Division
Overall Die (or Mask) REV Level (pre-requisite for qualification):	Rev. A
What ID markings on Die:	7C1334A

TECHNOLOGY/FAB PROCESS DESCRIPTION - R42D			
Number of Metal Layers:	2	Metal Composition:	Metal 1: TiW,AlCu,TiW/500Å,6000Å,300Å Metal 2: TiW,AlCu,TiW/500Å,8000Å,300Å
Passivation Type and Materials:	7000Å SiO_2 + 6000Å Si_3N_4		
Free Phosphorus contents in top glass layer(%):	0%		
Die Coating(s), if used:	N/A		
Generic Process Technology/Design Rule (µ-drawn):	CMOS, Double Metal /0.35 µm		
Gate Oxide Material/Thickness (MOS):	SiO_2 / 70 Å		
Name/Location of Die Fab (prime) Facility:	Cypress Semiconductor - Bloomington, MN		
Die Fab Line ID/Wafer Process ID:	Fab4/R42D		

PLASTIC PACKAGE/ASSEMBLY DESCRIPTION			
Package Outline, Type, or Name:	100 pins Thin Quad Flat Pack		
Mold Compound Name/Manufacturer:	Hitachi CEL9200		
Lead Frame material:	Copper Alloy 194		
Lead Finish, composition:	Solder Plated, 90%Sn, 10%Pb		
Die Attach Area Plating:	Silver Spot		
Die Attach Method:	Epoxy	Die Attach Material:	Ablestik 8361H
Wire Bond Method:	Thermosonic	Wire Material/Size:	Gold / 1.3 mil
JESD22-A112 Moisture Sensitivity Level:	Level 3		
Name/Location of Assembly (prime) facility:	ASE, Taiwan (TAIWAN-G)		

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

RELIABILITY TESTS PERFORMED

Stress/Test	Test Condition (Temp/Bias)	Result P/F
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc = 3.8 V, 150°C	P
Read and Record Life Test	Dynamic Operating Condition, Vcc = 3.8V, 150°C	P
High Temperature Steady State Life	Static Operating Condition, Vcc = 3.63V, 150°C	P
High Accelerated Saturation Test (HAST)	130°C, 85%RH, 3.63V Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs, 30C/60%RH)	P
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity Level 3 (192 Hrs, 30C/60%RH)	P
Electrostatic Discharge Human Body Model (ESD-HBM)	MIL-STD-883, Method 3015.7	2,200V
Electrostatic Discharge Charge Device Model (ESD-CDM)	Cypress Spec. 25-00020	500V
Latchup Sensitivity	In accordance with JEDEC 17. Cypress Spec. 01-00081	
Static Latchup		9.5V
Dynamic Latchup		5.5V
C-SAM	Cypress Spec 25-00104	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]	N/A	N/A	N/A	N/A	N/A
High Temperature Operating Life[2,3] Long Term Failure Rate	517,000 DHRs	1	0.7	170	23 FIT

[1] Early Failure Rate was not performed. A production burn-in of 48 Hrs at 150°C, 4.3V is required for the product.
[2] Assuming an ambient temperature of 55°C and a junction temperature rise of 15°C.
[3] Chi-squared 60% estimations 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 = Boltzmann's constant = 8.62×10^{-5} eV/Kelvin.
T_1 is the junction temperature of the device under stress and T_2 is the junction temperature of the device at use conditions.

RELIABILITY TEST DATA

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DEVICE	ASSY-LOC	FABLOT#	ASSYLOT#	DURATION	S/S	REJ	FAIL MODE
STRESS: CLASS YIELD							
CY7C1334-AC	TAIWN-G	4736443	349706242	CLS	1105	0	
CY7C1334-AC	TAIWN-G	4736443	349706242	CRS	1335	0	
CY7C1334-AC	TAIWN-G	4736443	349706242	CHS	1399	0	
CY7C1334-AC	TAIWN-G	4738601	619711701	CLS	1170	0	
CY7C1334-AC	TAIWN-G	4738601	619711701	CRS	1174	0	
CY7C1334-AC	TAIWN-G	4738601	619711701	CHS	1189	0	
CY7C1334-AC	TAIWN-G	4738601	619711702	CLS	702	0	
CY7C1334-AC	TAIWN-G	4738601	619711702	CRS	708	0	
CY7C1334-AC	TAIWN-G	4738601	619711702	CHS	720	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY7C1334-AC	TAIWN-G	4736443	349706242	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2200V							
CY7C1334-AC	TAIWN-G	4736443	349706242	COMP	3	0	
STRESS: HI-ACCEL SATURATION TEST (130C, 3.63V), PRECOND. 192 HRS 30C/60%RH							
CY7C1334-AC	TAIWN-G	4736443	349706242	128	48	0	
CY7C1334-AC	TAIWN-G	4736443	349706242	256	48	0	
STRESS: HIGH TEMP STEADY STATE LIFE TEST (150C, 3.63V)							
CY7C1334-AC	TAIWN-G	4736443	349706242	80	78	0	
CY7C1334-AC	TAIWN-G	4736443	349706242	168	78	0	
CY7C1334-AC	TAIWN-G	4738601	619711701	80	78	0	
CY7C1334-AC	TAIWN-G	4738601	619711701	168	78	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 3.8V)							
CY7C1334-AC	TAIWN-G	4736443	349706242	80	530	0	
CY7C1334-AC	TAIWN-G	4736443	349706242	500	530	1	1 LIFT BOND
CY7C1334-AC	TAIWN-G	4738601	619711701	80	525	0	
CY7C1334-AC	TAIWN-G	4738601	619711701	500	515	0	
STRESS: READ & RECORD LIFE TEST (150C, 3.8V)							
CY7C1334-AC	TAIWN-G	4736443	349706242	500	10	0	
STRESS: TC COND. C, -65 TO 150C, PRECOND. 192 HRS 30C/60%RH							
CY7C1334-AC	TAIWN-G	4736443	349706242	300	49	0	
CY7C1334-AC	TAIWN-G	4736443	349706242	1000	49	0	
CY7C1334-AC	TAIWN-G	4738601	619711701	300	49	0	
CY7C1334-AC	TAIWN-G	4738601	619711702	300	90	0	
CY7C1334-AC	TAIWN-G	4738601	619711702	1000	90	0	