

Cypress Semiconductor Product Qualification Report

**QTP# 97225 VERSION 2.0
August, 2003**

CY2318NZ

3.3V SDRAM Buffer for Desktop Pcs with 4 DIMMs

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

Ed Russell
Reliability Director
(408) 432-7069

Bill Stevenson
Reliability Engineering
(408) 456-1926

PRODUCT DESCRIPTION (for qualification)	
Information provided in this document is intended for generic qualification and technically describes the Cypress part supplied:	
Marketing Part #:	CY2318NZ
Package:	48 pins SSOP
Device Description:	3.3V SDRAM Buffer for Desktop PCs with 4 DIMMs
Cypress Division:	Cypress Semiconductor Corporation - CPD Division
Overall Die (or Mask) REV Level (pre-requisite for qualification):	Rev. A
What ID markings on Die:	7C83720A

TECHNOLOGY/FAB PROCESS DESCRIPTION - L28			
Number of Metal Layers:	2	Metal Composition:	Metal 1: 500A Ti/1,200A TiW/6,000A Al/1,200A TiW Metal 2: 1,500A TiW//10,000A Al/150A Ti
Passivation Type and Materials:	3,000A TEOS + 15,000A Si ₂ N ₄		
Free Phosphorus contents in top glass layer(%):	N/A		
Die Coating(s), if used:	N/A		
Generic Process Technology/Design Rule (μ-drawn):	CMOS, Single Poly, Double Metal /0.65 μm		
Gate Oxide Material/Thickness (MOS):	SiO ₂ / 145 A		
Name/Location of Die Fab (prime) Facility:	Cypress Semiconductor - Bloomington, MN		
Die Fab Line ID/Wafer Process ID:	Fab3/L28		

PLASTIC PACKAGE/ASSEMBLY DESCRIPTION			
Package Outline, Type, or Name:	48 Pins SSOP		
Mold Compound Name/Manufacturer:	Hitachi CEL-9200 (SSOP)		
Lead Frame material:	Copper		
Lead Finish, composition:	Solder Plated, 85%Sn, 15%Pb		
Die Attach Area Plating:	Solder Plate		
Die Attach Method:	Epoxy	Die Attach Material:	Ablestik
Wire Bond Method:	Thermosonic	Wire Material/Size:	Gold / 1.3 mil
JESD22-A112 Moisture Sensitivity Level	Level 1		
Assembly Line ID and Process ID:	Cypress Philippines (SSOP)		

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

RELIABILITY TESTS PERFORMED

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V MIL-STD-883, Method 3015.7	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	2,000V Cypress Spec. 25-00020	P
Latchup Sensitivity	10.5V In accordance with JEDEC 17. Cypress Spec. 01-00081	P

RELIABILITY FAILURE RATE SUMMARY

Stress/Test	Device Tested/ Device Hours	# Fails	Activation Energy	Thermal ³ A.F	Failure Rate ⁴
High Temperature Operating Life Early Failure Rate	1138 Devices	0	N/A	N/A	0 PPM
High Temperature Operating Life ^{1,2} Long Term Failure Rate	118,000 DHRs	0	0.7	170	46 FITs

¹ Assuming an ambient temperature of 55°C and a junction temperature rise of 15°C.

² Chi-squared 60% estimations used to calculate the failure rate.

³ 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.

⁴ Reliability failure rate is based on qualified by extension per QTP 96153.

DEVICE RELATED RELIABILITY TEST DATA

QTP#: 96513¹

DEVICE	ASSY-LOC	FABLOT#	ASSYLOT#	DURATION	S/S	REJ	FAIL MODE
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150C, 3.65V)							
CY2273APVC-1	KOREA-A	3705598	3705598	48	630	0	
CY2273APVC-1	TAIWN-T	3716122	619704148	48	508	0	
STRESS: ESD-CHARGE DEVICE MODEL (2000V)							
CY2278PAC-1	KOREA-L	3715952	619703688	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015 (4400V)							
CY2277APVC-1	KOREA-L	3701143	3701143.03	COMP	3	0	
CY2276PVC-11	KOREA-A	3713782	3713782.03	COMP	3	0	
CY2278PAC-1	KOREA-L	3715952	619703688	COMP	3	0	
STRESS: HI-ACCEL SATURATION TEST (140C, 5.5V), PRECOND. 168 HRS 85C/85%RH							
CY2276PVC-1	KOREA-L	3705598	3705598.A	128	50	0	
CY2276PVC-11	CSPI-R	3716099	619704633	128	45	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 3.65V)							
CY2273APVC-1	KOREA-A	3705598	3705598	80	120	0	
CY2273APVC-1	KOREA-A	3705598	3705598	500	120	0	
CY2273APVC-1	TAIWN-T	3716122	619704148	500	116	0	
STRESS: DYNAMIC LATCH-UP TESTING (10V)							
CY2278PAC-1	KOREA-L	3715952	619703688	DATA	3	0	
STRESS: TC COND. C, -65 TO 150C, PRECOND. 168 HRS 85C/85%RH							
CY2276PVC-1	KOREA-L	3701143	3701143.03	300	50	0	
CY2276PVC-1	KOREA-L	3701143	3701143.03	1000	50	0	
CY2276PVC-1	KOREA-L	3705598	3705598.A	300	50	0	
CY2276PVC-1	KOREA-L	3705598	3705598.A	1000	50	0	
CY2276PVC-11	KOREA-A	3713782	3713782.03	300	47	0	
CY2276PVC-11	KOREA-A	3713782	3713782.03	1000	47	0	

¹ QTP 96513, Clock Synthesizer, L28 Technology, Fab 3 qualification.