

# Cypress Semiconductor Qualification Report

QTP# 97501VERSION 1.1

November, 1998

CY7B991V

Programmable Skew Clock Buffer, 3.3V Operation

PRODUCT DESCRIPTION (for qualification)			
Information provided in this document is intended for generic qualification and technically describes the Cypress part supplied: CY7B991V (7B991 Rev V), SM1 technology			
Marketing Part #:	CY7B991V		
Package:	32 Ld PLCC		
Device Description:	Programmable Skew Clock Buffer		
Cypress Division:	Cypress Semiconductor Corporation – DCD Division		
Overall Die (or Mask) REV Level (pre-requisite for qualification):	Rev. V		
Die Size (stepping):	110 mils x 150 mils	What ID markings on Die:	7B991V

TECHNOLOGY/FAB PROCESS DESCRIPTION			
Number of Metal Layers:	2	Metal Composition:	Metal. 1: 500...Ti/1,200...TiW/6,000..Al, .....1200...TiW Metal. 2: 1,500K..TiW/10,000...Al
Passivation Type and Materials:	.....3,000...TEOS. +. 15,000...Oxynitride		
Free Phosphorus contents in top glass layer(%):	0% PSG		
Die Coating(s), if used:	NA		
Generic Process Technology/Design Rule ( $\mu$ -draw):	BiCMOS, Single Poly, Double Metal /0.8 $\mu$ m		
Gate Oxide Material/Thickness (MOS):	SiO <sub>2</sub> /.195..		
Name/Location of Die Fab (prime) Facility:	Cypress Semiconductor – Round Rock, TX		
Die Fab Line ID/Wafer Process ID:	Fab 2/SM1		

PLASTIC PACKAGE/ASSEMBLY DESCRIPTION			
Package Outline, Type, or Name:	32 Ld PLCC		
Mold Compound Name/Manufacturer:	Sumitomo EME-6300		
Lead Frame material:	Copper Alloy		
Lead Finish, composition:	Solder Plated, 85%Sn, 15%Pb		
Die Attach Area Plating:	Silver Spot		
Die Attach Method:	Epoxy	Die Attach Material:	Ablestik 84-1MISR4
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 Bangkok, Thailand		

**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 Early Failure Rate	Dynamic Operating Condition, Vcc = 4.8V, 125°C	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc = 4.8V, 125°C	P
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity Level 1 (168 Hrs 85°C/85% RH )	P
Electrostatic Discharge Human Body Model (ESD-HBM)	MIL-STD-883, Method 3015.7	4,400V
Electrostatic Discharge Charge Device Model (ESD-CDM)	Cypress Spec. 25-00020	1,000V
Latchup Sensitivity	In accordance with JEDEC 17. Cypress Spec. 01-00081 Static Latch-up Dynamic Latch-up	P 10V 9.3V

Stress/Test	Device Tested/ Devive Hours	# Fails	Activation Energy	Thermal AF <sup>3</sup>	Failure Rate
High Temperature Operating Life Early Failure Rate	1,000 Devices	0	N/A	N/A	0 PPM
High Temperature Operating Life <sup>1,2</sup> Long Term Failure Rate	60,000 DHRs	0	0.7	55	276 FIT

<sup>1</sup> Assuming an ambient temperature of 55°C and a junction temperature rise of 15°C.

<sup>2</sup> Chi-squared 60% estimations used to calculate the failure rate.

<sup>3</sup> 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 =  $8.62 \times 10^{-5}$  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

QTP#: 97501

DEVICE	ASSY-LOC	FABLOT#	ASSYLOT#	DURATION	S/S	REJ	FAIL MODE
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (125C, 4.8V)							
CY7B991V-JC	ALPHA-X	2812931	219803586L1	48	353	0	
CY7B991V-JC	ALPHA-X	2812931	219803586L1	48	647	0	
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STRESS: ESD-CHARGE DEVICE MODEL (1000V)							
CY7B991V-JC	ALPHA-X	2812931	219803586L1	COMP	12	0	
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STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015 (4400V)							
CY7B991V-JC	ALPHA-X	2812931	219803586L1	COMP	9	0	
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (125C, 4.8V)							
CY7B991V-JC	ALPHA-X	2812931	219803586L1	500	120	0	
CY7B991V-JC	ALPHA-X	2812931	219803586L1	80	120	0	
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STRESS: TC COND. C, -65 TO 150C, PRECOND. 168 HRS 85C/85%RH (MSL 1)							
CY7B991V-JC	ALPHA-X	2812931	219803586L1	300	50	0	
CY7B991V-JC	ALPHA-X	2812931	219803586L1	1000	50	0	
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