

Cypress Semiconductor Qualification Report

QTP# 98211, VERSION 1.0
February 1998

Pentium.. Processor. Compatible
Clock Synthesizer/Driver
(CY2252*/CY2254A*/CY2260*)

Pentium is trademark of Intel Corporation

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

Cypress Semiconductor – Quality & Reliability Department

(408)432-7069

PRODUCT/TECHNOLOGY/FAB DESCRIPTION

PRODUCT DESCRIPTION (for qualification)			
Qualification Purpose: To qualify CY2254A (7C82640A) and its options in a qualified technology, L28EPD in Fab 2.			
Marketing Part #:	CY2260		
Package:	28 pin SOIC		
Device Description:	Pentum Processor Compatible Clock Synthesizer/Driver		
Cypress Division:	Cypress Semiconductor Corporation – CPD Division		
Overall Die (or Mask) REV Level (pre-requisite for qualification):	Rev. A		
Die Size (stepping):	66 mils x 63 mils	What ID markings on Die:	7C82649A

TECHNOLOGY/FAB PROCESS DESCRIPTION – L28EPD			
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 OxyNitrate		
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 μ m		
Gate Oxide Material/Thickness (MOS):	SiO ₂ /.145..		
Name/Location of Die Fab (prime) Facility:	Cypres. Semiconductor... Round. Rock,. Texas		
Die Fab Line ID/Wafer Process ID:	Fab2/ L28EPD		

PLASTIC PACKAGE/ASSEMBLY DESCRIPTION

Package Outline, Type, or Name:	28-pin SOIC		
Mold Compound Name/Manufacturer:	Hitachi CEL 9200		
Lead Frame material:	Copper		
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 (previously qualified)		
Assembly Line ID and Process ID:	Omedata, Indonesia (INDNS-0)		

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

RELIABILITY TESTS PERFORMED

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Latchup Sensitivity – Static	In accordance with JEDEC 17. Cypress Spec. 01-00081	11.0V
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

RELIABILITY FAILURE RATE SUMMARY

Stress/Test	Device Tested/ Device Hours	# Fails	Activation Energy	Thermal AF ³	Failure Rate ⁴
High Temperature Operating Life Early Failure Rate	503	0	N/A	N/A	0 PPM
High Temperature Operating Life ^{1,2} Long Term Failure Rate	74,000	0	0.7	170	73 FIT

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 Failure rate was based on L28EPD Technology qualified in Fab2, QTP 98209.

RELIABILITY TEST DATA

QTP #: 98211

DEVICE	ASSY-LOC	FABLOT#	ASSYLOT#	DURATION	S/S	REJ	FAIL MODE
=====							
STRESS: ESD-CHARGE DEVICE MODEL (500V)							
CY2260SC	INDNS-O	2827367	519811754	COMP	3	0	

STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015 (2200V)							
CY2260SC	INDNS-O	2827367	519811754	COMP	3	0	

DEVICE RELATED RELIABILITY TEST DATA

QTP #: 98209¹

DEVICE	ASSY-LOC	FABLOT#	ASSYLOT#	DURATION	S/S	REJ	FAIL MODE
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150C, 5.75V)							
CY82C693-NC	ASE-J	2821994	619807947	48	168	0	
CY82C693-NC	ASE-J	2820922	619807948	48	168	0	
CY82C693-NC	ASE-J	2822021	619808385	48	167	0	
STRESS: ESD-CHARGE DEVICE MODEL (1000V)							
CY82C693-NC	ASE-J	2820922	619807948	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015 (2200V)							
CY82C693-NC	ASE-J	2820922	619807948	COMP	3	0	
STRESS: HI-ACCEL SATURATION TEST (140C, 5.5V), PRECOND. 192 HRS 30C/60%RH							
CY82C693-NC	ASE-J	2821994	619807947	128	45	0	
CY82C693-NC	ASE-J	2820922	619807948	128	45	0	
STRESS: HIGH TEMPERATURE STORAGE (165C, NO BIAS)							
CY82C693-NC	ASE-J	2820922	619807948	336	48	0	
CY82C693-NC	ASE-J	2820922	619807948	1000	48	0	
STRESS: HIGH TEMP STEADY STATE LIFE TEST (150C, 5.75V)							
CY82C693-NC	ASE-J	2820922	619807948	80	73	0	
CY82C693-NC	ASE-J	2820922	619807948	168	72	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 5.75V)							
CY82C693-NC	ASE-J	2821994	619807947	80	78	0	
CY82C693-NC	ASE-J	2821994	619807947	500	75	0	3 EOS
CY82C693-NC	ASE-J	2820922	619807948	80	78	0	
CY82C693-NC	ASE-J	2820922	619807948	500	73	0	5 EOS
STRESS: EXTENDED DYNAMIC BURN-IN (150C, 5.75V)							
CY82C693-NC	ASE-J	2820922	619807948	785	70	0	
STRESS: COLD LIFE TEST (-45C, 6.5V)							
CY74FCT543TSOC	CSPI-R	2816631	619805959/60/61	500	45	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH)							
CY82C693-NC	ASE-J	2820922	619807948	168	48	0	
STRESS: TC COND. C, -65 TO 150C, PRECOND. 192 HRS 30C/60%RH (MSL 3)							
CY82C693-NC	ASE-J	2821994	619807947	300	47	0	
CY82C693-NC	ASE-J	2820922	619807948	300	48	0	
CY82C693-NC	ASE-J	2820922	619807948	1000	48	0	

¹ QTP 98209, L28EPD Technology qualified in Fab 2.

