Cypress Semiconductor
Product Qualification Report

QTP# 98199 VERSION 2.0
August, 2003

Clock Synthesizer Driver - Fab 2 – L28 Technology	
CY2280	**Clock Synthesizer/Driver with Spread Spectrum, USB and Power-Down**
CY2281	**Clock Synthesizer/Driver with Spread Spectrum**
CY2282	**Clock Synthesizer/Driver with Spread Spectrum and USB**

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 #:	CY2280
Package:	48 pins SSOP
Device Description:	Clock Synthesizer/Driver
Cypress Division:	Cypress Semiconductor Corporation - CPD Division
Overall Die (or Mask) REV Level (pre-requisite for qualification):	Rev. A
What ID markings on Die:	7C83760A

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_2N_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 – Round Rock, TX		
Die Fab Line ID/Wafer Process ID:	Fab2/L28		

PLASTIC PACKAGE/ASSEMBLY DESCRIPTION			
Package Outline, Type, or Name:	48 Pins SSOP		
Mold Compound Name/Manufacturer:	Hitachi CEL-9200		
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 8361H
Wire Bond Method:	Thermosonic	Wire Material/Size:	Gold / 1.0 mil
JESD22-A112 Moisture Sensitivity Level	Level 1		
Assembly Line ID and Process ID:	Cypress Philippines		

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)	1,700V MIL-STD-883, Method 3015.7 (See Note)	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	1,000V Cypress Spec. 25-00020	P
Latchup Sensitivity	10V In accordance with JEDEC 17. Cypress Spec. 01-00081	P

Note: Does not meet 2,000V HBM requirement. Corrective action (C983103Q) has been assigned to improve Vss clamp and implement the fix to base line product, 7C83700A.

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	850 Devices	0	N/A	N/A	0 PPM
High Temperature Operating Life[1,2] Long Term Failure Rate	173,900 DHRs	0	0.7	170	31 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] Failure rate is based on L28 Technology qualified in Fab 2.

DEVICE RELATED RELIABILITY TEST DATA

QTP 97403[1]

DEVICE	ASSY-LOC	FABLOT#	ASSYLOT#	DURATION	S/S	REJ	FAIL MODE
STRESS: DATA BAKE-PLASTIC (165C, NO BIAS)							
CY2273APVC	CSPI-R	2732995	619708289/319	168	78	0	
CY2273APVC	CSPI-R	2732995	619708289/319	552	78	0	
CY2273APVC	CSPI-R	2735423	619709731	168	78	0	
CY2273APVC	CSPI-R	2735423	619709731	552	78	0	
CY2273APVC	CSPI-R	2734307	619709732	168	78	0	
CY2273APVC	CSPI-R	2734307	619709732	552	78	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150C, 3.65V)							
CY2273APVC	CSPI-R	2732995	619708289/319	48	180	0	
CY2273APVC	CSPI-R	2735423	619709731	48	340	0	
CY2273APVC	CSPI-R	2734307	619709732	48	330	0	
STRESS: ESD-CHARGE DEVICE MODEL, 2000V							
CY2273APVC	CSPI-R	2732995	619708289/319	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 4000V							
CY2273APVC	CSPI-R	2732995	619708289/319	COMP	3	0	
STRESS: HI-ACCEL SATURATION TEST (140C, 3.63V), PRECOND. 168 HRS 85C/85%RH							
CY2273APVC	CSPI-R	2732995	619708289/319	128	44	0	
CY2273APVC	CSPI-R	2732995	619708289/319	256	44	0	
CY2273APVC	CSPI-R	2734307	619709732	128	45	0	
STRESS: HIGH TEMPERATURE STORAGE (165C, NO BIAS)							
CY2273APVC	CSPI-R	2732995	619708289/319	336	45	0	
CY2273APVC	CSPI-R	2732995	619708289/319	500	45	0	
CY2273APVC	CSPI-R	2732995	619708289/319	1000	45	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 3.65V)							
CY2273APVC	CSPI-R	2732995	619708289/319	80	116	0	
CY2273APVC	CSPI-R	2732995	619708289/319	500	116	0	
CY2273APVC	CSPI-R	2735423	619709731	80	120	0	
CY2273APVC	CSPI-R	2735423	619709731	500	116	0	
CY2273APVC	CSPI-R	2734307	619709732	80	116	0	
CY2273APVC	CSPI-R	2734307	619709732	500	115	0	1 EOS
STRESS: COLD LIFE TEST (-30C, 6.5V)							
CY2273APVC	CSPI-R	2732995	619708289/319	500	45	0	
CY2273APVC	CSPI-R	2732995	619708289/319	1000	44	0	1 EOS
STRESS: READ & RECORD LIFE TEST (150C, 3.65V)							
CY2273APVC	CSPI-R	2734307	619709732	48	10	0	
CY2273APVC	CSPI-R	2734307	619709732	80	10	0	
CY2273APVC	CSPI-R	2734307	619709732	500	10	0	

[1] L28 Technology qualified in Fab2

DEVICE RELATED RELIABILITY TEST DATA

QTP 97403

DEVICE	ASSY-LOC	FABLOT#	ASSYLOT#	DURATION	S/S	REJ	FAIL MODE
STRESS: TC COND. C, -65 TO 150C, PRECOND. 168 HRS 85C/85%RH							
CY2273APVC	CSPI-R	2732995	619708289/319	300	45	0	
CY2273APVC	CSPI-R	2732995	619708289/319	1000	45	0	
CY2273APVC	CSPI-R	2735423	619709731	300	48	0	
CY2273APVC	CSPI-R	2735423	619709731	1000	48	0	
CY2273APVC	CSPI-R	2734307	619709732	300	47	0	
CY2273APVC	CSPI-R	2734307	619709732	1000	47	0	