Cypress Semiconductor
Qualification Report

QTP# 96361, V. 1.0
June, 1997

Double Sync ™ FIFO	
CY7C4081	Double 256 x 9
CY7C4811	Double 512 x 9
CY7C4821	Double 1K x 9
CY7C4831	Double 2K x 9
CY7C4841	Double 4K x 9
CY7C4851	Double 8K x 9

PRODUCT DESCRIPTION (for qualification)			
Information provided in this document is intended for generic qualification and technically describes the Cypress part supplied:			
Marketing Part #:	CY7C4851		
Package:	64 pins TQFP		
Device Description:	Double Sync (tm) FIFO		
Cypress Division:	Cypress Semiconductor Corporation - DCD Division		
Overall Die (or Mask) REV Level (pre-requisite for qualification):		Rev. A	
Die Size (stepping):	160 mils x 172 mils	What ID markings on Die:	Double CY7C4241A

TECHNOLOGY/FAB PROCESS DESCRIPTION - R28			
Number of Metal Layers:	2	Metal Composition:	Metal 1: Ti/TiW/Al-Si/TiW, 500Å/1.2KÅ/6KÅ/1.2KÅ Metal 2: TiW/Al-Si/TiW, 1.2KÅ/10KÅ/150Å
Passivation Type and Materials:		7000A TEOS + 6000A Si_2N_4	
Free Phosphorus contents in top glass layer(%):		N/A	
Die Coating(s), if used:	None		
Generic Process Technology/Design Rule (μ-drawn):		CMOS, Double Poly, Double Metal /0.65 μm	
Gate Oxide Material/Thickness (MOS):		SiO_2 / 165 A	
Name/Location of Die Fab (prime) Facility:		Cypress Semiconductor - Bloomington, MN	
Die Fab Line ID/Wafer Process ID:		Fab3/R28	

PLASTIC PACKAGE/ASSEMBLY DESCRIPTION			
Package Outline, Type, or Name:	64-pin TQFP		
Mold Compound Name/Manufacturer:	Sumitomo EME-7320		
Lead Frame material:	Copper		
Lead Finish, composition:	Solder Plated, 90%Sn, 10%Pb		
Die Attach Area Plating:	Silver Spot		
Die Attach Method:	Paste	Die Attach Material:	Silver Epoxy
Wire Bond Method:	Thermosonic	Wire Material/Size:	Gold / 1.3 mil
JESD22-A112 Moisture Sensitivity Level	Level 3		
Assembly Line ID and Process ID:	Anam, Korea (Korea-Q)		

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 = 5.75V, 150°C	P
High Accelerated Saturation Test (HAST)	140°C, 85%RH, 5.5V 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
High Temp Storage	165°C, no bias	P
Internal Visual	Cypress Spec 25-00017	P
Thermal Shock	Cypress Spec. 25-00014	P
X-Ray	MIL-STD-883 - 2012; Cypress Spec 12-000149	P
Acoustic Microscopy	JEDEC A112-A	P
Ball Shear	Cypress Spec 24-00018	P
Bond Pull	Cypress Spec 24-00002	P

RELIABILITY FAILURE RATE SUMMARY

Stress/Test	Device Tested/ Devive Hours	# Fails	Activation Energy	Acceleration Factor	Failure Rate[3]
High Temperature Operating Life Early Failure Rate	758 Devices	0	N/A	N/A	0 PPM
High Temperature Operating Life[1,2] Long Term Failure Rate	294,000 DHRs	0	0.6	82	38 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] Failure Rate is based on QTP 95243 (Synchronous FIFO, R28 Technology, Fab3 qualification) and QTP 96361 (Double Sync FIFO, R28 Technology, Fab3 qualification) .

RELIABILITY TEST DATA

QTP#: 96361

DEVICE	ASSY-LOC	FABLOT#	ASSYLOT#	DURATION	S/S	REJ	FAIL MODE
STRESS: HI-ACCEL SATURATION TEST (140C, 5.5V), PRECOND. 192 HRS 30C/60%RH							
CY7C4851-AC	KOREA-Q	3635959	349612847	128	80	0	
CY7C4851-AC	KOREA-Q	3635959	349612849	128	34	0	
CY7C4851-AC	KOREA-Q	3635959	349612849	128	50	1	Corroded bond pad
STRESS: HIGH TEMPERATURE STORAGE (165C, NO BIAS)							
CY7C4851-AC	KOREA-Q	3635959	349612847	336	90	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 5.75V)							
CY7C4851-AC	KOREA-Q	3635959	349612847	80	124	0	
CY7C4851-AC	KOREA-Q	3635959	349612847	500	124	0	
STRESS: TC COND. C, -65 TO 150C, PRECOND. 192 HRS 30C/60%RH							
CY7C4851-AC	KOREA-Q	3635959	349612847	300	80	0	
CY7C4851-AC	KOREA-Q	3635959	349612847	1000	80	0	
CY7C4851-AC	KOREA-Q	3635959	349612848	300	84	0	
CY7C4851-AC	KOREA-Q	3635959	349612848	1000	84	0	
CY7C4851-AC	KOREA-Q	3635959	349612849	300	84	0	
STRESS: THERMAL SHOCK, CONDITION B							
CY7C4851-AC	KOREA-Q	3635959	349612847	100	90	0	
CY7C4851-AC	KOREA-Q	3635959	349612847	200	90	0	

DEVICE RELATED RELIABILITY TEST DATA

QTP#: 95243[1]

DEVICE	ASSY-LOC	FABLOT#	ASSYLOT#	DURATION	S/S	Rej	Fail Mode
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150C, 5.75V)							
CY7C4245-JC	KOREA-A	3524436	349515555	48	758	0	
STRESS: HI-ACCEL SATURATION TEST (140C, 85%RH, 5.5V), PRECONDITION 48 HRS PCT							
CY7C4245-JC	KOREA-A	3524436	349515555	128	50	0	
STRESS: HIGH TEMP STEADY STATE LIFE TEST (125C, 5.75V)							
CY7C4245-JC	KOREA-A	3524436	349515555	168	76	0	
CY7C4245-JC	KOREA-A	3524436	349515555	336	76	0	
CY7C4245-JC	KOREA-A	3524436	349515555	500	76	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 5.75V)							
CY7C4245-JC	KOREA-A	3524436	349515555	80	116	0	
CY7C4245-JC	KOREA-A	3524436	349515555	500	116	0	
STRESS: EXTENDED DYNAMIC BURN-IN (150C, 5.75V)							
CY7C4245-JC	KOREA-A	3524436	349515555	1000	116	0	
CY7C4245-JC	KOREA-A	3524436	349515555	2000	116	0	
STRESS: PRESSURE COOKER TEST (121C, 100%RH)							
CY7C4245-JC	KOREA-A	3524436	349515555	168	52	0	
STRESS: READ & RECORD LIFE TEST (150C, 5.75V)							
CY7C4245-JC	KOREA-A	3524436	349515555	80	10	0	
CY7C4245-JC	KOREA-A	3524436	349515555	500	10	0	
STRESS: TEMP CYCLE, COND. C, -65 TO 150C, PRECONDITION 48 HRS PCT							
CY7C4245-JC	KOREA-A	3524436	349515555	300	50	0	

[1] QTP 95243, Synchronous FIFO, R28 Technology, Fab 3 qualification.