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Cypress Semiconductor
Product Qualification Report

QTP# 97483 VERSION *C
May 2017

Low Voltage Deep Synchronous FIFO High Speed 100-MHZ Operation R42D – Fab 4	
CY7C4255V **CY7C4265V** **CY7C4275V** **CY7C4285V**	**8K/16K/32K/64K x 18**
CY7C4261V **CY7C4271V** **CY7C4281V** **CY7C4291V**	**16K/32K/64K/128K x 9**
CY7C4282V **CY7C4292V**	**64K/128K x 9**

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
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PRODUCT QUALIFICATION HISTORY

Qual Report	Description of Qualification Purpose	Date Comp
97211	New R42D Technology Qualification	Oct 97
97396	New 4Meg Product Qualification	May 98
97483	New Synchronous FIFO Product Qualification	Apr 00

PRODUCT DESCRIPTION (for qualification)	
To qualify 7C4385A and 7C43* Sync FIFO family in R42D Technology, Fab4.	
Marketing Part #:	CY7C4285V
Device Description:	3.3V, Commercial available in 64-pin STQFP and 32-pin PLCC package
Cypress Division:	Cypress Semiconductor Corporation – MPD

TECHNOLOGY/FAB PROCESS DESCRIPTION			
Number of Metal Layers:	Proprietary	Metal Composition:	Proprietary
Passivation Type and Materials:			Proprietary
Generic Process Technology/Design Rule (□-drawn):			Proprietary
Gate Oxide Material/Thickness (MOS):			Proprietary
Name/Location of Die Fab (prime) Facility:			Cypress Semiconductor – Bloomington, MN
Die Fab Line ID/Wafer Process ID:			Fab4 / R42D

PACKAGE	ASSEMBLY SITE FACILITY
64-Pin STQFP	**ASE-Taiwan(G)**
32-pin PLCC	**Amkor –Phil (MB)**

Note: Package Qualification details upon request

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	J68
Package Outline, Type, or Name:	68 lead Plastic Leaded Chip Carrier (PLCC)
Mold Compound Name/Manufacturer:	G600
Mold Compound Flammability Rating:	V-O per UL 94
Oxygen Rating Index:	None
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	Pure Sn
Die Backside Preparation Method/Metallization:	Grinding
Die Separation Method:	Wafer Saw
Die Attach Supplier:	Ablestik
Die Attach Material:	8361J
Wire Bond Method:	Thermosonic
Wire Material/Size:	Gold, 1.0mil
Thermal Resistance Theta JA °C/W:	65.10 °C/W
Package Cross Section Yes/No:	Yes
Assembly Process Flow:	49-14012
Name/Location of Assembly (prime) facility:	Amkor Philippines (PHIL-M)
MSL Level	3
Reflow Profile	260C

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	Cypress Philippines (CML-R)
Fault Coverage:	100%

Note: Please contact a Cypress Representative for other package availability

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc = 3.8, 150°C	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc = 3.8, 150°C	P
Read and Record Life Test	Dynamic Operating Condition, Vcc = 3.8V, 150°C	P
High Temperature Steady State Life	Static Operating Condition, Vcc = 3.63V, 150°C	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110, 130 C, 85%RH, 3.63V Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH, 260C Reflow)	P
High Temp Storage	150 C, No bias	P
Pressure Cooker Test	JESD22-A102, 121 C, 100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH, 260C Reflow)	P
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65 C to 150 C Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30 C°, 60% RH, 260C Reflow)	P
Age Bond Strength	200°C, 4HRS MIL-STD-883, Method 883-2011	P
Current Density	Meets the Technology Device Level Reliability Specifications	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V, JESD22-A114E	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V, JESD22-C101C	P
Cold Life Test	Dynamic Operating Condition, Vcc = 4.4V, -30C	P
Dynamic Latchup	In accordance with JESD78	P
Static Latchup	125°C , ± 200mA, In accordance with JESD78	P

RELIABILITY FAILURE RATE SUMMARY

Stress/Test	Device Tested/ Device Hours	# Fails	Activation Energy	Thermal AF[3]	Failure Rate
High Temperature Operating Life Early Failure Rate	3418 Devices	1	N/A	N/A	293 PPM
High Temperature Operating Life[1,2] Long Term Failure Rate	1,664,080 DHRs	2	0.7	170	11 FIT

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

Reliability Test Data

QTP #: 97211

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-CHARGE DEVICE MODEL, 1000V							
CY7C1021V33-VC	4719474	TAIWN-G	619704310	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B, 1100V							
CY7C1021V33-VC	4719474	TAIWN-G	619704310	COMP	3	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, (3.63), PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1021V33-VC	4719474	TAIWN-G	619704310	128	64	0	
CY7C1021V33-VC	4719474	TAIWN-G	619704310	256	64	0	
CY7C1021V33-VC	4721588	TAIWN-G	619705012	128	96	0	
STRESS: HIGH TEMP DYNAMIC STEADY STATE LIFE TEST ,150C,3.63V							
CY7C1021V33-VC	4719474	TAIWN-G	619704310	80	160	0	
CY7C1021V33-VC	4719474	TAIWN-G	619704310	168	160	0	
CY7C1021V33-VC	4721588	TAIWN-G	619705012	80	160	0	
CY7C1021V33-VC	4721588	TAIWN-G	619705012	168	160	0	
CY7C1021V33-VC	4722642	TAIWN-G	619705819	80	156	0	
CY7C1021V33-VC	4722642	TAIWN-G	619705819	168	156	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 3.80V , Vcc Max							
CY7C1021V33-VC	4719474	TAIWN-G	619704310	80	538	0	
CY7C1021V33-VC	4719474	TAIWN-G	619704310	500	538	1	Single Bit
CY7C1021V33-VC	4721588	TAIWN-G	619705012	80	528	0	
CY7C1021V33-VC	4721588	TAIWN-G	619705012	500	528	1	Single Bit
CY7C1021V33-VC	4722642	TAIWN-G	619705819	80	525	0	
CY7C1021V33-VC	4722642	TAIWN-G	619705819	500	525	0	
STRESS: HIGH TEMP STORGAGE, PLASTIC, 150C							
CY7C1021V33-VC	4719474	TAIWN-G	619704310	336	48	0	
CY7C1021V33-VC	4719474	TAIWN-G	619704310	1000	48	0	
STRESS: LONG LIFE VERIFICATION, 150C, 3.80V							
CY7C1021V33-VC	4719474	TAIWN-G	619704310	1000	527	0	

Reliability Test Data

QTP #: 97211

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: READ & RECCORD LIFETEST , 150C, 3.80V							
CY7C1021V33-VC	4719474	TAIWN-G	619704310	80	10	0	
CY7C1021V33-VC	4719474	TAIWN-G	619704310	1000	10	0	
STRESS: TC CONDITION C, -65C TO 150C, PRE COND. 192 HRS 30C/60% RH, MSL3							
CY7C1021V33-VC	4719474	TAIWN-G	619704310	300	90	0	
CY7C1021V33-VC	4719474	TAIWN-G	619704310	1000	90	0	
CY7C1021V33-VC	4721588	TAIWN-G	619705012	300	96	0	
CY7C1021V33-VC	4721588	TAIWN-G	619705012	1000	96	0	
CY7C1021V33-VC	4722642	TAIWN-G	619705819	300	90	0	

Reliability Test Data

QTP #: 97396

Device	Assy Loc	Fab Lot #	Assy Lot #	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-CHARGE DEVICE MODEL, 1000V							
CY7C1049V33-VC	AMKOR-L	4743899	619711944	COMP	3	0	
CY7C1049V33-VC	CML-R	4751412	619801712	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B, 4,4000V							
CY7C1049V33-VC	AMKOR-L	4744957	619800476	COMP	3	0	
CY7C1041V33-VC	CML-R	4751412	619801712	COMP	3	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, (3.63), PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1049V33-VC	AMKOR-L	4743899	619711944	128	45	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 3.80V , Vcc Max							
CY7C1049V33-VC	AMKOR-L	4744980	619711941	48	217	0	
CY7C1049V33-VC	AMKOR-L	4743899	619711944	48	410	1- METAL DEFECT	
CY7C1049V33-VC	AMKOR-L	4745051	619800475	48	756	0	
CY7C1049V33-VC	AMKOR-L	4744957	619800476	48	443	0	
CY7C1049V33-VC	AMKOR-L	4741412	619801943	48	1186	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 3.80V , Vcc Max							
CY7C1049V33-VC	AMKOR-L	4745051	619800475	80	380	0	
CY7C1049V33-VC	AMKOR-L	4745051	619800475	500	379	0	
CY7C1049V33-VC	AMKOR-L	4744957	619800476	80	304	0	
CY7C1049V33-VC	AMKOR-L	4744957	619800476	500	304	0	
STRESS: HIGH TEMP DYNAMIC STEADY STATE LIFE TEST ,150C,3.63V							
CY7C1049V33-VC	AMKOR-L	4745051	619800475	80	76	0	
CY7C1049V33-VC	AMKOR-L	4745051	619800475	168	76	0	
CY7C1049V33-VC	AMKOR-L	4744957	619800476	80	75	0	
CY7C1049V33-VC	AMKOR-L	4744957	619800476	168	74	0	
STRESS: COLD LIFE TEST , -30C, 4.3V							
CY7C1049V33-VC	AMKOR-L	4743899	619711944	500	41	0	
CY7C1049V33-VC	AMKOR-L	4743899	619711944	1000	41	0	

Reliability Test Data

QTP #: 97396

Device	Assy Loc	Fab Lot #	Assy Lot #	Duration	Samp	Rej	Failure Mechanism
STRESS: READ & RECCORD LIFETEST , 150C, 3.80V							
CY7C1049V33-VC	AMKOR-L	4743899	619711944	80	10	0	
CY7C1049V33-VC	AMKOR-L	4743899	619711944	500	10	0	
STRESS: TC CONDITION C, -65C TO 150C, PRE COND. 192 HRS 30C/60% RH, MSL3							
CY7C1049V33-VC	AMKOR-L	4743899	619711944	300	45	0	
CY7C1049V33-VC	AMKOR-L	4743899	619711944	1000	45	0	
CY7C1049V33-VC	AMKOR-L	4745051	619800475	300	45	0	
CY7C1049V33-VC	AMKOR-L	4745051	619800475	1000	45	0	
CY7C1049V33-VC	AMKOR-L	4744957	619800476	300	45	0	
CY7C1049V33-VC	AMKOR-L	4744957	619800476	1000	45	0	

Reliability Test Data

QTP #: 97843

Device	Assy Loc	Fab Lot #	Assy Lot #	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-CHARGE DEVICE MODEL, 1500V							
CY7C4285V-JC	ALPHA-X	4801569	219801126	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114-B, 2,200V							
CY7C4285V-JC	ALPHA-X	4801569	219801126	COMP	3	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, (3.63), PRE COND 192 HR 30C/60%RH, MSL3							
CY7C4285V-JC	ALPHA-X	4801569	219801126	128	45	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 150C, 3.80V , Vcc Max							
CY7C4285V-JC	ALPHA-X	4801569	219801126	48	406	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 3.80V , Vcc Max							
CY7C4285V-JC	ALPHA-X	4801569	219801126	80	405	0	
CY7C4285V-JC	ALPHA-X	4801569	219801126	500	405	0	
STRESS: HIGH TEMP DYNAMIC STEADY STATE LIFE TEST ,150C,3.63V							
CY7C4285V-JC	ALPHA-X	4801569	219801126	80	76	0	
CY7C4285V-JC	ALPHA-X	4801569	219801126	168	76	0	
STRESS: READ & RECCORD LIFETEST , 150C, 3.80V							
CY7C4285V-JC	ALPHA-X	4801569	219801126	48	10	0	
CY7C4285V-JC	ALPHA-X	4801569	219801126	80	10	0	
CY7C4285V-JC	ALPHA-X	4801569	219801126	500	10	0	
STRESS: TC CONDITION C, -65C TO 150C, PRE COND. 192 HRS 30C/60% RH, MSL3							
CY7C4285V-JC	ALPHA-X	4801569	219801126	300	45	0	
CY7C4285V-JC	ALPHA-X	4801569	219801126	1000	45	0	

Document History Page

Document Title: QTP# 97483: LOW VOLTAGE DEEP SYNC FIFO'S - R42D TECHNOLOGY, FAB4, DEVICE:CY7C42*V
Document Number: 001-87638

Rev.	ECN No.	Orig. of Change	Description of Change
**	4005272	ILZ	Initial Spec Release Qualification report published on Cypress.com is not in spec format. Initiated spec for QTP 97483 and updated current assembly site and package information qualified for package options for this device qualifcation.
*A	4383832	HSTO	Align qualification report based on the new template in the front page
*B	4775580	HSTO	Update reference for Reliability Director
*C	5724843	HSTO DCON	Update Cypress logo Update contact person for Reliability Manager and Director Update product description and technology/fab process description table Deleted Obsolete specs Removed Distribution and Posting from the document history page.