



THIS SPEC IS OBSOLETE

Spec No: 001-88642

Spec Title: QTP#97476: 256K STATIC RAM "CY7C194/CY7195/
CY7C199" R28 PROCESS,FAB 2 QUALIFICATION

Replaced by: None

Cypress Semiconductor Product Qualification Report

QTP# 97476 rev*A
August 2016

256K Static RAM, R28 Process, Fab 2 Qualification	
CY7C194/CY7195/CY7C199	32k X 8 Static RAM

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

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PRODUCT QUALIFICATION HISTORY

Qual Report	Description of Qualification Purpose	Date Comp
97476	Qualify Fab 2 for 256K SRAM, R28 process (Rev0. And Rev.R)	Nov. 1997

OBSCURED

PRODUCT DESCRIPTION (for qualification)	
Qualification Purpose: Qualify Fab 2 for 256K SRAM, R28 process (Rev O. and Rev. R)	
Marketing Part #:	CY7C199
Package:	28 pins, 300 mil SOJ
Device Description	32K x 8 Static RAM
Cypress Division:	Cypress Semiconductor Corporation – MPD Division
Overall Die (or Mask) RE Level (pre-requisite for qualification	Rev. O and Rev. R
What ID markings on Die	7C199C

TECHNOLOGY/FAB PROCESS DESCRIPTION –R28	
Number of Metal Layers	2
Metal Composition:	Metal 1: Ti/TiW/Al-Si/TiW, 500Å/1.2KÅ/6KÅ/1.2K Å Metal 2: TiW/Al-Si/TiW, 1.2KÅ/10KÅ/150Å
Passivation Type and Materials:	7000A TEOS + 6000A Si2N4
Free Phosphorus contents in top glass layer (%):	N/A
Die Coating(s), if used:	None
Number of Transistor in device	
Number of Gate in device	
Generic Process Technology /Design Rule (□-drawn):	CMOS, Double Poly, Double Metal /0.65 □m You a
Gate Oxide Material/Thickness (MOS):in	SiO2 / 165 Å
Name/Location of Die Fab (prime) Facility:	Cypress Semiconductor – Round Rock, TX
Die Fab Line ID/Wafer Process ID:	Fab2/R28

PLASTIC PACKAGE / ASSEMBLY DESCRIPTION	
Package Outline, Type, or Name:	28-pin, 300 mil SOJ
Mold Compound Name/Manufacturer:	Sumitomo EME-6300H or Nito MP-8000
Lead Frame Material:	Copper Alloy 194
Lead Finish, Composition / Thickness:	Solder Plated, 90±5%Sn, 10±%Pb
Die Attach Area Plating:	Silver Spot
Die Attach Material:	Ablestik 8361
Die Attach Method:	Paste
Wire Bond Method:	Thermosonic
Wire Material/Size:	Gold / 1.0 mil
Assembly Line ID and Process ID:	Cypress Philippines (CSPI-R) Omedata, Indonesia (INDNS-O)

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

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENT

Stress/Test	Test Condition (Temp/Bias)	Result P/F
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc = 5.75V, 150C	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc = 5.75V, 150C	P
Read and Record Life Test	Dynamic Operating Condition, Vcc = 5.75V, 150C	P
Long Life Verification	Dynamic Operating Condition, Vcc = 5.75V, 150C	P
Cold Life Test	Dynamic Operating Condition, Vcc = 6.5V, -30C	P
High Temperature Steady State Life	Static Operating Condition, Vcc = 5.5V, 150C	P
High Accelerated Saturation Test (HAST)	140C, 85%RH, 5.5V Precondition: JESD22 Moisture Sensitivity Level 1 (168 Hrs, 85/85% RH)	P
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity Level 1 (168 Hrs, 85/85% RH)	P
High Temperature Storage	165C, no bias	P
Age bond pull	MIL STD 883, Method 2011	P
Current Density	meets the Technology Device	P
Electrostatic Discharge Human Body Model (ESD-HBM)	MIL-STD-883, Method 3015.7	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	JESD22-C101	P
Latchup Sensitivity Static Latchup Sensitivity	In accordance with JEDEC 17.	P

RELIABILITY FAILURE RATE SUMMARY

Stress/Test	Device Tested/ Device Hours	# Fails	Activation Energy	Thermal ³ A.F	Failure Rate
High Temperature Operating Life Early Failure Rate ³	1,610 Devices	0	N/A	N/A	0 PPM
High Temperature Operating Life ^{1,2} Long Term Failure Rate	633,360 DHRs	0	0.7	170	9 FIT

³ 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 #: 97476

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150C, 5.75V)

CY7C199-VC	2734322	519711442D	INDNS-O	48	540	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	48	535	0	
CY7C199-VC	2733162	619707989	CSPI-R	48	535	0	

STRESS: ESD-CHARGE DEVICE MODEL

CY7C199-VC	2734322	519711442D	INDNS-O	COMP	3	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	COMP	3	0	

STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015

CY7C199-VC	2734322	519711442D	INDNS-O	COMP	3	0	
CY7C199-VC	2736541	619708989	CSPI-R	COMP	3	0	

STRESS: HI-ACCEL SATURATION TEST (140C, 5.5V), PRECOND. 168 HRS 85C/85%RH

CY7C199-VC	2733142	619707330/7/8	CSPI-R	128	48	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	256	48	0	
CY7C199-VC	2733162	619707989	CSPI-R	128	45	0	
CY7C199-VC	2733162	619707989	CSPI-R	128	50	0	
CY7C199-VC	2735410	619708288	CSPI-R	128	45	0	
CY7C199-VC	2735410	619708288	CSPI-R	128	48	0	
CY7C199-VC	2736541	619708989	CSPI-R	128	47	0	

STRESS: HIGH TEMPERATURE STORAGE (165C, NO BIAS)

CY7C199-VC	2733142	619707330/7/8	CSPI-R	336	48	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	500	48	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	1000	48	0	

STRESS: HIGH TEMP STEADY STATE LIFE TEST (150C, 5.50V)

CY7C199-VC	2733142	619707330/7/8	CSPI-R	80	81	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	168	81	0	
CY7C199-VC	2736541	619708989	CSPI-R	80	80	0	
CY7C199-VC	2736541	619708989	CSPI-R	168	80	0	

Reliability Test Data

QTP #: 97476

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 5.75V)

CY7C199-VC	2734322	519711442D	INDNS-O	80	540	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	80	535	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	500	533	0	
CY7C199-VC	2733162	619707989	CSPI-R	80	527	0	
CY7C199-VC	2733162	619707989	CSPI-R	500	527	0	

STRESS: LONG LIFE VERIFICATION (150C, 5.75V)

CY7C199-VC	2733142	619707330/7/8	CSPI-R	1000	120	0	
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STRESS: COLD LIFE TEST (-30C, 6.5V)

CY7C199-VC	2733142	619707330/7/8	CSPI-R	500	45	0	
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STRESS: READ & RECORD LIFE TEST (150C, 5.75V)

CY7C199-VC	2733142	619707330/7/8	CSPI-R	48	10	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	80	10	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	500	10	0	

STRESS: TC COND. C, -65 TO 150C, PRECOND. 168 HRS 85C/85%RH

CY7C199-VC	2733142	619707330/7/8	CSPI-R	300	48	0	
CY7C199-VC	2733142	619707330/7/8	CSPI-R	1000	48	0	
CY7C199-VC	2733162	619707989	CSPI-R	300	50	0	
CY7C199-VC	2733162	619707989	CSPI-R	1000	50	0	

Document History Page

Document Title: QTP#97476: 256K Static RAM "CY7C194/CY7195/CY7C199" R28 Process,Fab 2 Qualification
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Rev.	ECN No.	Orig. of Change	Description of Change
**	4083753	HSTO	Initial Spec Release Qualification report published on Cypress.com and was transferred to qualification report spec template.
*A	5384830	HSTO	Obsolete specs

Distribution: WEB

Posting: None