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Cypress Semiconductor Product Qualification Report

QTP# 194010 VERSION**
March 2020

Radiation Hardened 144 Meg QDR SRAM Device Family LL65P-18R+ Technology, UMC Fab 12A	
Part Numbers	Die Part Number
CYRS1642KV18-250GCMB (144M QDR2+, x18, Burst of 2, 250MHz) w/o ODT	7M1653K
CYRS1643KV18-250GCMB (144M QDR2+, x18, Burst of 4, 250MHz) w/o ODT	7M1653K
CYRS1644KV18-250GCMB (144M QDR2+, x36, Burst of 2, 250MHz) w/o ODT	7M1653K
CYRS1645KV18-250GCMB (144M QDR2+, x36, Burst of 4, 250MHz) w/o ODT	7M1653K
CYRS2642KV18-250GCMB (144M QDR2+, x18, Burst of 2, 250MHz) w/ ODT	7M1653K
CYRS2643KV18-250GCMB (144M QDR2+, x18, Burst of 4, 250MHz) w/ ODT	7M1653K
CYRS2644KV18-250GCMB (144M QDR2+, x36, Burst of 2, 250MHz) w/ ODT	7M1653K
CYRS2645KV18-250GCMB (144M QDR2+, x36, Burst of 4, 250MHz) w/ ODT	7M1653K
QML Part Numbers	Die Part Number
5962R1821403VXF (144M QDR2+, x18, Burst of 2, 250MHz) w/o ODT	7M1653K
5962R1821404VXF (144M QDR2+, x18, Burst of 4, 250MHz) w/o ODT	7M1653K
5962R1821503VXF (144M QDR2+, x36, Burst of 2, 250MHz) w/o ODT	7M1653K
5962R1821504VXF (144M QDR2+, x36, Burst of 4, 250MHz) w/o ODT	7M1653K
5962R1821401VXF (144M QDR2+, x18, Burst of 2, 250MHz) w/ ODT	7M1653K
5962R1821402VXF (144M QDR2+, x18, Burst of 4, 250MHz) w/ ODT	7M1653K
5962R1821501VXF (144M QDR2+, x36, Burst of 2, 250MHz) w/ ODT	7M1653K
5962R1821502VXF (144M QDR2+, x36, Burst of 4, 250MHz) w/ ODT	7M1653K
Prototype Part Numbers	Die Part Number
CYPT1642KV18-250GCMB (144M QDR2+, x18, Burst of 2, 250MHz) w/o ODT	7C1653K
CYPT1643KV18-250GCMB (144M QDR2+, x18, Burst of 4, 250MHz) w/o ODT	7C1653K
CYPT1644KV18-250GCMB (144M QDR2+, x36, Burst of 2, 250MHz) w/o ODT	7C1653K
CYPT1645KV18-250GCMB (144M QDR2+, x36, Burst of 4, 250MHz) w/o ODT	7C1653K
CYPT2642KV18-250GCMB (144M QDR2+, x18, Burst of 2, 250MHz) w/ ODT	7C1653K
CYPT2643KV18-250GCMB (144M QDR2+, x18, Burst of 4, 250MHz) w/ ODT	7C1653K
CYPT2644KV18-250GCMB (144M QDR2+, x36, Burst of 2, 250MHz) w/ ODT	7C1653K
CYPT2645KV18-250GCMB (144M QDR2+, x36, Burst of 4, 250MHz) w/ ODT	7C1653K
Wafer/Die Part Numbers	Die Part Number
CYPT2643KV18-1X24M (144M QDR2+ Prototype Die in Waffle Tray)	7C1653K
CYRS2643KV18-1X24M (144M QDR2+ QML-V Die in Waffle Tray)	7M1653K

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT

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QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date Comp
091706	Qualification of 65nm (LL65) Technology at UMC Fab 12A and New Device CY7C1553K Base Die 72M QDR Product Family	Aug. 2009
093202	Qualification of UMC 65nm Process Improvement	Nov. 2009
103405	LL65 144M QDR Product Family Qualification	Dec. 2010
194010	LL65 144M QDR SRAM RadHard QML Class V Device Qualification	Dec. 2019

PRODUCT DESCRIPTION (for qualification)	
Qualification Purpose:	Qualify Radiation Hardened 144 Meg QDR SRAM Device Family using LL65P-18R+ Technology at UMC Fab 12A
Marketing Part #:	CYRS1642KV18*/ CYRS1643KV18*/ CYRS1644KV18*/ CYRS1645KV18*/CYRS2642KV18*/ CYRS2643KV18*/ CYRS2644KV18*/ CYRS2645KV18*/ 5962R1821403VXF/ 5962R1821404VXF/5962R1821503VXF/5962R1821504VXF/ 5962R1821401VXF/5962R1821402VXF/5962R1821501VXF 5962R1821502VXF/ CYPT1642KV18*/ CYPT1643KV18*/ CYPT1644KV18*/ CYPT1645KV18*/ CYPT2642KV18*/ CYPT2643KV18*/ CYPT2644KV18*/ CYPT2645KV18*/ CYPT2643KV18*/CYRS2643KV18*
Device Description:	144 Megabit Quad Data Rate SRAM Device
Cypress Division:	Cypress Semiconductor Corporation – Memory Product Division (MPD)

TECHNOLOGY/FAB PROCESS DESCRIPTION – LL65P-18R+			
Number of Metal Layers:	Proprietary	Metal Composition:	Proprietary
Passivation Type and Materials:	Proprietary		
Generic Process Technology/Design Rule (μ -drawn):	Proprietary		
Gate Oxide Material/Thickness (MOS):	Proprietary		
Name/Location of Die Fab (prime) Facility:	UMC, Taiwan		
Die Fab Line ID/Wafer Process ID:	Fab 12A, LL65P-18R+		

PACKAGE	ASSEMBLY SITE FACILITY
165 CCGA	DPACI (Simi Valley, California)

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	165 CCGA
Package Outline, Type, or Name:	21x25x5.38mm
Package Outline Drawing	001-58969
Substrate Material Designation:	Ceramic Substrate
Lead Frame Design:	Kyocera/Ceramic Substrate KD-NB8152
Lead/solder Finish Composition & Thickness	80/20 Pb/Sn Columns with Cu Ribbon (Six Sigma)
Die Attach material	JM7000/Henkel
Die Separation Method:	Wafer Saw
Solder Ball Designation:	Pitch: 1.27mm, Diameter: 0.51mm
Wire Bond Method:	Wedge Bond
Package Cross Section Yes/No:	Yes
Name/Location of Assembly (prime) facility:	DPACI (Simi Valley, California)
MSL Level	N/A
Reflow Profile	N/A

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	Cypress Semiconductor (San Jose, California)

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, Boost Regulated at Core 1.45V, External 2.05V, 125°C JESD22-A108	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Boost Regulated at Core 1.45V, External 2.05V, 125°C /150°C JESD22-A108	P
Pre/Post LFR AC/DC Char	AC/DC Critical Parameter Char at LFR 80hrs, 500hrs & 1000hrs	P
High Temperature Steady State Life	Static Operating Condition, Vcc Max= 2.25V, 150°C Static Operating Condition, Vcc Max= 2.05V, 125°C JESD22-A108	P
Low Temperature Operating Life	Dynamic Operating Condition, Vcc = 2.25V, -30°C JESD22-A108	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 85%RH, 2.25V Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30°C/60%RH+ Reflow, 260°C +0, -5°C	P
Temperature Humidity Bias Test (THB)	JESD22-A101: 85°C, 85%RH, 2.25V Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30°C/60%RH+ Reflow, 260°C +0, -5°C	P
Temperature Cycle	MIL-STD-883, Method 1010, Condition C, -65°C to 150°C MIL-STD-883, Method 1010, Condition B, -55°C to 125°C Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30°C/60%RH+ Reflow, 260°C +0, -5°C	P
Pressure Cooker	JESD22-A102: 121°C, 100%RH, 15 Psig Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30°C/60%RH+ Reflow, 260°C +0, -5°C	P
High Temperature Storage	JESD22-A103: 150°C, no bias	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V JESD22-A114	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V, JESD22-C101	P
Electrostatic Discharge Machine Model (ESD-MM)	200V, JESD22-A115	P
Soft Error (Alpha Particle)	JESD89	P
Soft Error (Neutron/Proton)	JESD89	P
Current Density	Meets the Technology Device Level Reliability Specifications	P
Age Bond Strength	200°C, 4HRS MIL-STD-883, Method 883-2011	P
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30°C/60%RH+ Reflow, 260°C +0, -5°C	P
Dynamic Latch up	JESD78	P
Static Latch up	125C, ± 140mA JESD78	P

RELIABILITY TESTS PERFORMED PER MILITARY QUALIFICATION SPECIFICATION REQUIREMENT

Stress/Test	Sample Size	V-Class Level Stress Test	Results
Resistance to Solvent	3	(DPA) – B1	Pass
Die Shear/Stud Pull	3	(DPA) – B2	Pass
Bond Pull	4 (22 wires)	(DPA) – B2	Pass
Solderability	3 (22 leads)	(DPA) – B3	Pass
Military Group C 125C	45	(DPA) – C1	Pass
Temperature Cycle	15	(DPA) - Group D	Pass
Physical Dimension	15	(DPA) – D1	Pass
Lead Integrity	2 (45 columns)	(DPA) – D2	Pass
Thermal Series	15	(DPA) – D3	Pass
Mechanical Series	15	(DPA) – D4	Pass
Salt Atmosphere	3	(DPA) – D5	Pass
Internal Water Vapor	3	(DPA) – D6 <5K ppm H2O	Pass
Soldering Heat	3	(DPA) – D9	Pass
ESD-HBM (>2000V)	3	Per JEDEC Spec	Pass
ESD-CDM (>500V)	3	Per JEDEC Spec	Pass
SEE/TCI/TID/DRL/Radiation	3	(JDI) - Group E	Pass
ELDRS	3	(JDI) - Group E	Pass
Static Latch-up	3	Per JEDEC Spec	Pass
X-ray	100% of lot	Non-destructive required 100% in-line	Pass
Final Visual Inspection	All qual samples	Use DPA data – Non destructive	Pass
Baseline Spec	Memo	Per spec	001-65976
Revise OBOM	Spec	Per spec	001-73649

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	3,033 Devices	0	N/A	N/A	0 PPM
High Temperature Operating Life ^{1,2} Long Term Failure Rate (150°C)	89,000 DHRs	0	0.7	170	15 FIT
High Temperature Operating Life ^{1,2} Long Term Failure Rate (125°C)	805,008 DHRs	0	0.7	55	

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 = 8.62x10⁻⁵ eV/Kelvin.

T₁ is the junction temperature of the device under stress and T₂ is the junction temperature of the device at use conditions.

Reliability Test Data

QTP #: 091706

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY7C1514KV18 (7C1553K)	8842022	610851583	TAIWN-G	COMP	15	0	
CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	COMP	15	0	
CY7C1514KV18 (7C1553K)	8844022	610906896	TAIWN-G	COMP	15	0	
STRESS: AGE BOND STRENGTH							
CY7C1514KV18 (7C1553K)	8842022	610851583	TAIWN-G	COMP	5	0	
CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	COMP	5	0	
CY7C1514KV18 (7C1553K)	8844022	610906896	TAIWN-G	COMP	5	0	
STRESS: DYNAMIC LATCH-UP							
CY7C1470V33 (7C1470A)	4321389	610417278	CML-R	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JEDEC EIA/JESD22-A114, 2,200V							
CY7C1514KV18 (7C1553K)	8842022	610852338	TAIWN-G	COMP	8	0	
CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	COMP	8	0	
CY7C1514KV18 (7C1553K)	8844022	610906896	TAIWN-G	COMP	8	0	
CY7C1514KV18 (7C1553K)	8844021	610908348	TAIWN-G	COMP	8	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY7C1514KV18 (7C1553K)	8842022	610852338	TAIWN-G	COMP	9	0	
CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	COMP	9	0	
CY7C1514KV18 (7C1553K)	8844022	610906896	TAIWN-G	COMP	9	0	
STRESS: ESD-MACHINE MODEL, 200V							
CY7C1514KV18 (7C1553K)	8842022	610852338	TAIWN-G	COMP	5	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 2.25V, PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	128	78	0	
CY7C1514KV18 (7C1553K)	8844022	610906896	TAIWN-G	128	77	0	
STRESS: HIGH TEMPERATURE STORAGE, PLASTIC, 150C							
CY7C1514KV18 (7C1553K)	8844020	610851583	TAIWN-G	1000	70	0	
STRESS: HIGH TEMP STEADY STATE LIFE TEST, 150C, 2.25V, Vcc Max							
CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	336	77	0	

Reliability Test Data

QTP #: 091706

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, BOOST REGULATED AT CORE 1.45V, EXTERNAL 2.05V

CY7C15631KV18 (7C1553K)	8908001	610920385	TAIWN-G	96	2367	0	
CY7C15631KV18 (7C1553K)	8912000	610920386	TAIWN-G	96	2217	0	
CY7C15631KV18 (7C1553K)	8910015	610920548	TAIWN-G	96	1321	0	

STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, BOOST REGULATED AT CORE 1.45V, EXTERNAL 2.05V

CY7C1514KV18 (7C1553K)	8844021	610908348	TAIWN-G	500	178	0	
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 125C, BOOST REGULATED AT CORE 1.45V, EXTERNAL 2.05V

CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	1000	178	0	
CY7C1514KV18 (7C1553K)	8844022	610906896	TAIWN-G	1000	178	0	

STRESS: LOW TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, -30C, 2.25V Vcc

CY7C1514KV18 (7C1553K)	8842022	610852338	TAIWN-G	500	45	0	
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STRESS: PRESSURE COOKER TEST, 121C, 100%RH, 15 Psig, PRE COND 192 HR 30C/60%RH, MSL3

CY7C1514KV18 (7C1553K)	8842022	610851583	TAIWN-G	168	76	0	
CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	168	78	0	
CY7C1514KV18 (7C1553K)	8844022	610906896	TAIWN-G	168	77	0	

STRESS: Pre-/ Post HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE CHAR

CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	COMP	10	0	
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STRESS: STATIC LATCH-UP TESTING, 125C, 3.42V, +/-240mA

CY7C1514KV18 (7C1553K)	8844020	610854680	TAIWN-G	COMP	9	0	
CY7C1514KV18 (7C1553K)	8844022	610906896	TAIWN-G	COMP	9	0	
CY7C1514KV18 (7C1553K)	8844021	610908348	TAIWN-G	COMP	9	0	
CY7C15631KV18 (7C1553K)	8911000	610922436	TAIWN-G	COMP	9	0	

STRESS: TEMPERATURE CYCLE COND. C -65C TO 150C, PRE COND 192 HRS 30C/60%RH, MSL3

CY7C1514KV18 (7C1553K)	8842022	610851583	TAIWN-G	1000	77	0	
CY7C1514KV18 (7C1553K)	8844020	610854240	TAIWN-G	1000	78	0	
CY7C1514KV18 (7C1553K)	8844022	610906896	TAIWN-G	1000	77	0	

STRESS: STRESS: TEMPRATURE HUMIDITY TEST, 85C, 85%RH, 2.25V, PRE COND 192 HR 30C/60%RH, MSL3

CY7C1514KV18 (7C1553K)	8842022	610851583	TAIWN-G	1000	77	0	
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Reliability Test Data

QTP #: 091706

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: SER – ALPHA PARTICLE, 3-TEPM, 3-VOLTAGE, @ 85C, Vcc Nom

CY7C1514KV18 (7C1553K)	8842022	610851583	TAIWN-G	COMP	3	0	
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STRESS: X-SECTION/STEM XY AUDIT

CY7C1514KV18 (7C1553K)	8842022	610851583	TAIWN-G	COMP	1WF		
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Reliability Test Data

QTP #: 093202

<i>Device</i>	<i>Fab Lot #</i>	<i>Assy Lot #</i>	<i>Ass Loc</i>	<i>Duration</i>	<i>Samp</i>	<i>Rej</i>	<i>Failure Mechanism</i>
STRESS: ESD-HUMAN BODY CIRCUIT PER JEDEC EIA/JESD22-A114, 2,200V							
CY7C15631KV18 (7C1553K)	8911000	610922435	TAIWN-G	COMP	8	0	
STRESS: HIGH TEMPERATURE STORAGE, PLASTIC, 150C							
CY7C15631KV18 (7C1553K)	8911000	610922435	TAIWN-G	1000	80	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, BOOST REGULATED AT CORE 1.45V, EXTERNAL 2.05V							
CY7C15631KV18 (7C1553K)	8912000	610921675	TAIWN-G	96	596	0	
CY7C15631KV18 (7C1553K)	8910015	610921676	TAIWN-G	96	711	0	
CY7C15631KV18 (7C1553K)	8911000	610922435	TAIWN-G	96	1795	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 125C, BOOST REGULATED AT CORE 1.45V, EXTERNAL 2.05V							
CY7C15631KV18 (7C1553K)	8912000	610921675	TAIWN-G	168	190	0	
CY7C15631KV18 (7C1553K)	8911000	610922435	TAIWN-G	500	184	0	

Reliability Test Data

QTP #: 103405

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC, MSL3							
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	COMP	15	0	
CY7C1612K (7C1612K)	8845001	611032555	CML-RA	COMP	15	0	
CY7C1612K (7C1612K)	8845001	611032554	CML-RA	COMP	15	0	
CY7C1612K (7C1612K)	8908003	611024882	CML-RA	COMP	230	0	
CY7C1612K (7C1612K)	8845001	611024890	CML-RA	COMP	15	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JEDEC EIA/JESD22-A114, 2,200V							
CY7C16539K (7C16539K)	8845004	610933466	G-Taiwan	COMP	8	0	
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	COMP	8	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY7C16539K (7C16539K)	8845004	610933466	G-Taiwan	COMP	9	0	
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	COMP	9	0	
STRESS: ESD-MACHINE MODEL, 200V							
CY7C16539K (7C16539K)	8845004	610933466	G-Taiwan	COMP	5	0	
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	COMP	5	0	
STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 2.05V), PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	264	76	0	
CY7C1612K (7C1612K)	8908003	611024882	CML-RA	264	72	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 2.05V, REG ON							
CY7C16538K (7C16538K)	8937000	610945141	G-Taiwan	96	48	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, BOOST REGULATED AT CORE 1.45V, EXTERNAL 2.05V							
CY7C16538K (7C16538K)	8937000	610944083	G-Taiwan	96	1809	0	
CY7C1614K (7C1614K)	8927001	610946060	G-Taiwan	96	1224	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 125C, BOOST REGULATED AT CORE 1.45V, EXTERNAL 2.05V							
CY7C16538K (7C16538K)	8937000	610944083	G-Taiwan	168	178	0	
CY7C16538K (7C16538K)	8937000	610944083	G-Taiwan	1000	178	0	
CY7C1614K (7C1614K)	8927001	610946060	G-Taiwan	168	178	0	
CY7C1614K (7C1614K)	8927001	610946060	G-Taiwan	1000	178	0	

Reliability Test Data

QTP #: 103405

<i>Device</i>	<i>Fab Lot #</i>	<i>Assy Lot #</i>	<i>Ass Loc</i>	<i>Duration</i>	<i>Samp</i>	<i>Rej</i>	<i>Failure Mechanism</i>
STRESS: HIGH TEMP STORAGE 150C							
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	500	76	0	
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	1000	74	0	
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	1500	66	0	
CY7C1612K (7C1612K)	8908003	611024882	CML-RA	500	77	0	
CY7C1612K (7C1612K)	8908003	611024882	CML-RA	1000	76	0	
STRESS: HIGH TEMP STEADY STATE LIFE TEST, 150C, 2.05V, Vcc Max							
CY7C16539K (7C16539K)	8845004	610933941	CML-RA	168	77	0	
CY7C16539K (7C16539K)	8845004	610933941	CML-RA	336	77	0	
STRESS: PRESSURE COOKER TEST, 121C, 100%RH, PRE COND 192 HR 30C/60%RH, MSL3							
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	168	75	0	
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	288	72	0	
CY7C1612K (7C1612K)	8845001	611032555	CML-RA	168	73	0	
CY7C1612K (7C1612K)	8845001	611032555	CML-RA	288	73	0	
STRESS: Pre-/ Post HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE CHAR							
CY7C16538K (7C16538K)	8937000	610944083	G-Taiwan	COMP	10	0	
CY7C1614K (7C1614K)	8927001	610946060	G-Taiwan	COMP	10	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 3.42V, +/-180mA							
CY7C16539K (7C16539K)	8845004	610933466	TAIWN-G	COMP	9	0	
CY7C1612K (7C1612K)	8845001	611032553	CML-RA	COMP	9	0	
STRESS: TC COND. B -55C TO 125C, PRE COND192 HRS 30C/60%RH, MSL3							
CY7C1614KV (7C1614K)	8945028	611036123	CML-RA	500	74	0	
CY7C1614KV (7C1614K)	8945028	611036123	CML-RA	1000	74	0	
CY7C1614KV (7C1614K)	8945028	611036123	CML-RA	1300	74	0	
CY7C1618KV (7C1618K)	8945028	611036125	CML-RA	500	76	0	
CY7C1618KV (7C1618K)	8945028	611036125	CML-RA	1000	75	0	
CY7C1618KV (7C1618K)	8945028	611036125	CML-RA	1300	75	0	
CY7C1613KV (7C1613K)	8015005	611041460	CML-RA	500	77	0	
CY7C1613KV (7C1613K)	8015005	611041460	CML-RA	1000	77	0	
CY7C1613KV (7C1613K)	8015005	611041460	CML-RA	1300	77	0	

Reliability Test Data

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<i>Device</i>	<i>Fab Lot #</i>	<i>Assy Lot #</i>	<i>Assy Loc</i>	<i>Duration</i>	<i>Samp</i>	<i>Rej</i>	<i>Failure Mechanism</i>
STRESS: B1 – RESISTANCE TO SOLVENT							
CYRS2645KV18-250	9729013	621800011	DP	COMP	3	0	
STRESS: B2- BOND PULL							
CYRS2645KV18-250	9729013	621800011	DP	COMP	4	0	
STRESS: B2 – DIE SHEAR							
CYRS2645KV18-250	9729013	621800011	DP	COMP	3	0	
STRESS: B3 – SOLDERABILITY TEST							
CYRS2645KV18-250	9729013	621800011	DP	COMP	3	0	
STRESS: D1 – PHYSICAL DIMENSION							
CYRS2645KV18-250	9729013	621800011	DP	COMP	15	0	
STRESS: D2 – LEAD INTEGRITY							
CYRS2645KV18-250	9729013	621800011	DP	COMP	2	0	
STRESS: D3 – THERMAL SERIES							
CYRS2645KV18-250	9729013	621800011	DP	COMP	15	0	
STRESS: D4 – MECHANICAL SERIES							
CYRS2645KV18-250	9729013	621800011	DP	COMP	15	0	
STRESS: D5 – SALT ATMOSPHERE							
CYRS2645KV18-250	9729013	621800011	DP	COMP	3	0	
STRESS: D6 – INTERNAL WATER VAPOR							
CYRS2645KV18-250	9729013	621800011	DP	COMP	3	0	
STRESS: D9 – SOLDERING HEAT							
CYRS2645KV18-250	9729013	621800011	DP	COMP	3	0	
STRES: X-RAY							
CYRS2645KV18-250	9729013	621800011	DP	COMP	109	0	

Reliability Test Data

QTP #: 194010

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ENHANCED LOW DOSE RATE SENSITIVITY TEST (ELDRS)							
CYRS2645KV18-250	9729013	621800011	DP	COMP	10	0	
STRESS: ESD-CHARGE DEVICE MODEL							
CYRS2645KV18-250	9729013	621800011	DP	500	3	0	
STRESS: ESD-HUMAN BODY MODEL							
CYRS2645KV18-250	9729013	621800011	DP	2000	3	0	
CYRS2645KV18-250	9729013	621800011	DP	3000	3	0	
CYRS2645KV18-250	9729013	621800011	DP	4000	3	0	
STRESS: GROUP C, 125C, Vcc = 1.95V							
CYRS2645KV18-250	9729013	621800011	DP	1000hrs	47	0	
STRESS: GROUP E							
CYRS2645KV18-250	9729013	621800011	DP	TCI	12	0	
CYRS2645KV18-250	9729013	621800011	DP	TID	13	0	
CYRS2645KV18-250	9729013	621800011	DP	Transient Ionization	5	0	
CYRS2645KV18-250	9729013	621800011	DP	Dose Rate Latch-up	5	0	
CYRS2645KV18-250	9729013	621800011	DP	SEE	5	0	
STRESS: PRE/ POST HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE CHAR							
CYRS2645KV18-250	9729013	621800011	DP	COMP	10+2	0	
STRESS: S/LATCH-UP, +/-200mA, 2.85V, 125C,							
CYRS2645KV18-250	9729013	621800011	DP	COMP	6	0	

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LL65P-18R+ Technology, UMC Fab 12A
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Rev.	ECN No.	Orig. of Change	Description of Change
**	6819993	JYF	Initial spec release.