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Cypress Semiconductor
Product Qualification Report

QTP# 024110
June 2013

1 MEG (3.0V) MOBL DEVICES RAM8NLD-1.8V TECHNOLOGY, FAB4	
CY62126DV30 MoBL®	**1 Mb (64K x 16) Static RAM**
CY62127DV30 MoBL®	**1 Mb (64K x 16) Static RAM**
CY62167DV18 MoBL2®	**1 Mb (64K x 16) Static RAM**
CY62127DV20 MoBL2®	**1 M (64K x 16) Static RAM**
CY62128DV30 MoBL®	**1 Mb (128K x 8) Static RAM**

CYPRESS TECHNICAL CONTACT FOR QUALIFICATION DATA:

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TECHNOLOGY QUALIFICATION HISTORY

Qual Report	Description of Qualification Purpose	Date Comp
031102	New Technology R8LD-1.8V / New Device, 8Meg, MoBL Static RAM CY62155DV* and family	Mar 03
024110	New Device Qual, 1Meg, MoBL Static RAM CY62125DV* 3V and Options on RAM8NLD-1.8 Technology	Jun 03
032901	New Masks, PIM, MM1 and V1M for CY62125DV* 3V and Options on RAM8NLD-1.8, Fab 4 Technology	Jul 03
033803	New Masks, LI1M, CTM1, MM1, for CY62125DC (1Meg MoBL) using RAM8NLD-1.8 Technology, Fab4 Process	Oct 03

PRODUCT DESCRIPTION (for qualification)		
Qualification Purpose: Qualify CY62125DV* device and family, RAM8NLD-1.8 Technology		
Marketing Part #:	CY62125DV*, CY62126DV*, CY62127DV*, CY62128DV*	
Device Description:	2.2V-3.6V, Industrial available in 48-Ball FBGA package.	
Cypress Division:	Cypress Semiconductor Corporation –Memory Product Division (MPD)	
Overall Die (or Mask) REV Level (pre-requisite for qualification):		Rev. D
What ID markings on Die	7C62125D	

TECHNOLOGY/FAB PROCESS DESCRIPTION – RAM8NLD-1.8			
Number of Metal Layers:	2	Metal Composition:	Metal 1: 150 Å Ti / 300 Å Al / 300 Å Cu Metal 2: 300 Å Ti / 8000 Å Al
Passivation Type and Materials:	1000Å TEOS / 9000Å Si3N4		
Free Phosphorus contents in top glass layer (%)	N/A		
Number of Transistors in Device	~6.5 million		
Number of Gates in Device	~6.5 million		
Generic Process Technology/Design Rule (□-drawn):	0.13 □m		
Gate Oxide Material/Thickness (MOS):	26Å		
Name/Location of Die Fab (prime) Facility	Cypress Semiconductor -- Bloomington, MN		
Die Fab Line ID/Wafer Process ID:	Fab4/RAM8NLD-1.8V		

PACKAGE AVAILABILITY

PACKAGE	ASSEMBLY SITE FACILITY
48-Ball FBGA	**TAIWN-G**
44-Lead TSOP II **32-Lead SOIC/STSOP I, /RTSOP I**	**CML-RA, CHINA, JT**

Note: Package Qualification details upon request

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	BA48
Package Outline, Type, or Name:	48-ball Fine Pitch Ball Grid Array (FBGA)
Mold Compound Name/Manufacturer:	PLASKON SMT-B1
Mold Compound Flammability Rating:	V-O per UL94
Oxygen Rating Index:	>28%
Substrate Material:	BT Resin
Lead Finish, Composition / Thickness:	Solder Ball, 63%Sn, 37%Pb
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	100%
Die Attach Supplier:	Ablestik
Die Attach Material:	Ablestik 8355F
Die Attach Method:	Epoxy
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au, 1.0um
Thermal Resistance Theta JA °C/W:	73 /W
Package Cross Section Yes/No:	N/A
Name/Location of Assembly (prime) facility:	Taiwan-G

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	**CML-RA, KYEC,Taiwan**
Fault Coverage:	100%

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 Max = 2.4V, 125^{0}C	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc Max = 2.4V, 150^{0}C	P
High Temperature Steady State Life	Static Operating Condition, Vcc Max = 2.2V, 150^{0}C	P
High Accelerated Saturation Test (HAST)	130^{0}C 2.2V/3,6V, 85%RH Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH, 235^{0}C +0, -5^{0}C Reflow	P
Temperature Cycle	MIL-STD-883C, Method 1010, Condition C, -65^{0}C to 150^{0}C Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs, 30C/60%RH, 235^{0}C +0, -5^{0}C Reflow	P
Pressure Cooker	121^{0}C, 100%RH Precondition: JESD22 Moisture Sensitivity MSL 3 192 Hrs, 30C/60%RH, 235^{0}C +0, -5^{0}C Reflow	P
High Temperature Storage	150^{0}C,No bias	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V MIL-STD-883, Method 3015.7	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V, JESD22-C101C	P
Age Bond Strength	200C, 4HRS MIL-STD-883, Method 883-2011	P
Low Temperature Operating Life	-30C, 2.35V, 8MHZ	P
Acoustic Microscopy	J-STD-020	P
Dynamic Latch-up	125C, 3.55V/6.5V	P
Static Latch-up	125C, 6.5V/10V, 300mA In accordance with JEDEC 17	P

RELIABILITY FAILURE RATE SUMMARY

Stress/Test	Device Tested/ Device Hours	# Fails	Activation Energy	Thermal AF[4]	Failure Rate
High Temperature Operating Life Early Failure Rate	8034	2	N/A	N/A	249 PPM
High Temperature Operating Life[1,2,] Long Term Failure Rate	769,520 DHRs	0	0.7	170	7 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] 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 #: 031102

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC-MSL3							
CY62157DV20 (7C62357D)	4151609	*610205573N*	TAIWN-G	COMP	20	0	
CY62157DV20 (7C62357D)	4205767	*610210027*	TAIWN-G	COMP	20	0	
CY62157DV20 (7C62357D)	4210625	*610216786N1*	TAIWN-G	COMP	20	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 2.4V, Vcc Max							
CY62157DV20 (7C62357D)	4247883	*610303398*	TAIWN-G	96	1390	0	
CY62157DV20 (7C62357D)	4230988	*610240982N*	TAIWN-G	96	1191	0	
CY62157DV20 (7C62357D)	4151609	*610205573N*	TAIWN-G	72	1109	0	
CY62157DV20 (7C62357D)	4205767	*610210027*	TAIWN-G	72	858	1	POLY PARTICLE
CY62157DV20 (7C62357D)	4210625	*610216786N1*	TAIWN-G	72	1103	1	NON-VISUAL
CY62157DV20 (7C62357D)	4214343	*610221185*	TAIWN-G	72	834	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 2.4V, Vcc Max							
CY62157DV20 (7C62357D)	4222101	*610234320*	TAIWN-G	80	416	0	
CY62157DV20 (7C62357D)	4222101	*610234320*	TAIWN-G	500	383	0	
CY62157DV20 (7C62357D)	4230988	*610240982N*	TAIWN-G	80	418	0	
CY62157DV20 (7C62357D)	4230988	*610240982N*	TAIWN-G	500	415	0	
CY62157DV20 (7C62357D)	4214343	*610221185*	TAIWN-G	80	410	0	
CY62157DV20 (7C62357D)	4214343	*610221185*	TAIWN-G	500	330	0	
STRESS: HIGH TEMP STEADY STATE LIFE TEST, 150C, 2.2V, Vcc MAX							
CY62157DV20 (7C62357D)	4151609	*610205573N*	TAIWN-G	80	80	0	
CY62157DV20 (7C62357D)	4151609	*610205573N*	TAIWN-G	180	74	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2,200V							
CY62157DV20 (7C62357D)	4151609	*610205573*	TAIWN-G	COMP	9	0	
CY62157DV20 (7C62357D)	4205767	*610210027*	TAIWN-G	COMP	9	0	
CY62157DV20 (7C62357D)	4210625	*610216786*	TAIWN-G	COMP	9	0	
CY62157DV20 (7C62357D)	4215571	*610222767N*	TAIWN-G	COMP	9	0	
CY62157DV20 (7C62357D)	4216781	*610223553*	TAIWN-G	COMP	9	0	

Reliability Test Data

QTP #: 031102

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY62157DV20 (7C62357D)	4215571	*610222767N*	TAIWN-G	COMP	9	0	
CY62157DV20 (7C62357D)	4214343	*610221278*	TAIWN-G	COMP	9	0	
CY62157DV20 (7C62357D)	4216781	*610223553*	TAIWN-G	COMP	9	0	
STRESS: DYNAMIC LATCH-UP TESTING, 125C, 3.55V							
CY62157DV20 (7C62357D)	4205767	*610210027*	TAIWN-G	COMP	3	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 6.5V, 300mA							
CY62157DV20 (7C62357D)	4151609	*610205573*	TAIWN-G	COMP	3	0	
CY62157DV20 (7C62357D)	4205767	*610210027*	TAIWN-G	COMP	3	0	
CY62157DV20 (7C62357D)	4210625	*610216786*	TAIWN-G	COMP	3	0	
STRESS: LOW TEMPERATURE OPERATING LIFE, -30C, 2.35V							
CY62157DV20 (7C62357D)	4151609	*610205573*	TAIWN-G	500	50	0	
STRESS: HIGH TEMPERATURE STORAGE, 150C							
CY62157DV20 (7C62357D)	4151609	*610205573N*	TAIWN-G	500	50	0	
CY62157DV20 (7C62357D)	4151609	*610205573N*	TAIWN-G	1000	50	0	
STRESS: AGE BOND STRENGTH							
CY62157DV20 (7C62357D)	4151609	*610205573*	TAIWN-G	COMP	5	0	
CY62157DV20 (7C62357D)	4205767	*610210027*	TAIWN-G	COMP	5	0	
CY62157DV20 (7C62357D)	4210625	*610216786*	TAIWN-G	COMP	5	0	
STRESS: PRESSURE COOKER TEST, 121C, 100%RH, PRE COND 192 HR 30C/60%RH, MSL3							
CY62157DV20 (7C62357D)	4151609	*610205573N*	TAIWN-G	176	50	0	
CY62157DV20 (7C62357D)	4205767	*610210027*	TAIWN-G	176	50	0	
CY62157DV20 (7C62357D)	4210625	*610216786N1*	TAIWN-G	168	50	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 1.98V, PRE COND 192 HR 30C/60%RH, MSL3							
CY62157DV20 (7C62357D)	4151609	*610205573*	TAIWN-G	128	50	0	
CY62157DV20 (7C62357D)	4205767	*610210027*	TAIWN-G	128	48	0	
CY62157DV20 (7C62357D)	4210625	*610216786*	TAIWN-G	128	59	0	

Reliability Test Data

QTP #: 031102

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH, MSL3							
CY62157DV20 (7C62357D)	4151609	*610205573N*	TAIWN-G	300	40	0	
CY62157DV20 (7C62357D)	4205767	*610210027*	TAIWN-G	300	50	0	
CY62157DV20 (7C62357D)	4210625	*610216786N1*	TAIWN-G	300	50	0	

Reliability Test Data

QTP #: 024110

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC-MSL3							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	COMP	15	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE, 125C, 2.4V, Vcc Max							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	96	1549	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE, 150C, 2.4V, Vcc Max							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	80	395	0	
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	500	392	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2,200V							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	COMP	9	0	
CY62127DV30 (7C62127D)	4306659	*610325590/1/2*	TAIWN-G	COMP	9	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	COMP	9	0	
CY62127DV30 (7C62127D)	4306659	*610325590/1/2*	TAIWN-G	COMP	9	0	
STRESS: DYNAMIC LATCH-UP TESTING, 125C, 6.5V							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	COMP	3	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 10V, □300mA							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	COMP	3	0	
CY62127DV30 (7C62127D)	4306659	*610325590/1/2*	TAIWN-G	COMP	3	0	
STRESS: LOW TEMPERATURE OPERATING LIFE, -30C, 2.35V							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	500	45	0	
STRESS: HI-ACCEL SATURATION TEST, 130C, 85%RH, 3.6V, PRE COND 192 HR 30C/60%RH, MSL3							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	128	45	0	
STRESS: TC COND. C -65C TO 150C, PRECONDITION 192 HRS 30C/60%RH, MSL3							
CY62127DV30 (7C62127D)	4305387	*610312496*	TAIWN-G	300	50	0	

Reliability Test Data

QTP #: 032901

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2,200V							
CY62127DV30L (7C62127D)	4315232	*610330180/1*	CML-R	COMP	9	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY62127DV30L (7C62127D)	4315232	*610330180/1*	CML-R	COMP	9	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 10V, **300mA**							
CY62127DV30L (7C62127D)	4315232	*610330180/1*	CML-R	COMP	3	0	

Reliability Test Data

QTP #: 033803

Device	Fab Lot #	Assy Lot #	Ass Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2,200V							
CY62127DV30L (7C62127D)	4315293	*610344238*	CML-R	COMP	9	0	
STRESS: ESD-CHARGE DEVICE MODEL, 500V							
CY62127DV30L (7C62127D)	4315293	*610344238*	CML-R	COMP	9	0	
STRESS: STATIC LATCH-UP TESTING, 125C, 7.5V, 300mA							
CY62127DV30L (7C62127D)	4315293	*610344238*	CML-R	COMP	3	0	

Document History Page

Document Title: QTP # 024110 : 1 MEG (3.0V) MOBL DEVICES RAM8NLD-1.8V TECHNOLOGY, FAB4
Document Number: 001-87912

Rev.	ECN No.	Orig. of Change	Description of Change
**	4026890	ILZ	Initial Spec Release Qualification report published on Cypress.com is documented on memo LGQ-306 and not in spec format. Initiated spec for QTP 024110 and data from LGQ-306 was transferred to qualification report spec template. Updated package availability based on current qualified test & assembly site. Deleted Cypress reference Spec and replaced with Industry Standards.

Distribution: WEB

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