Cypress Semiconductor
Reliability Qualification Report

QTP# D22120b Version **

BCM20734UA1KFFB3G

Qualification of: BCM20734UA1KFFB3G, Bluetooth 4.1 Compliant Baseband Processor with Integrated 2.4 GHz Transceiver in FCFBGA (8.5 x 8.5 x 1.05mm) 90 Ball, Flip Chip Fine Pitch Ball Grid Array Package (FCFBGA)

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
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I. Product and Package Information

Product Description: BCM20734UA1KFFB3G **Cypress Division:** IoT Division

Bluetooth 4.1 Compliant Baseband Processor with Integrated 2.4 GHz Transceiver

Package: FCFBGA **QTP:** D22120b

Description: (8.5 x 8.5 x 1.05mm) 90 Ball, Flip Chip Fine Pitch Ball Grid Array Package (FCFBG **Flammability:** UL-V0 **O2 Index:** >28

Assembly: ASE Taiwan **Molding Compound:** N/A

Electrical Test: ASE **Theta Ja / Psi Jt:** 21 °C/W / 1 °C/W

Substrate/Leadframe: N/A **Die Attachment:** N/A

Lead Finish: 98.5Sn/1Ag/0.5Cu **Bond Wire:** N/A

Comments:

Est. Field Temperature: 55 °C **Life Test Temperature:** 125 °C

Est. DC Field Current: 26 mA **Life Test Dynamic Current:** 5 mA

Est. Field Voltage: 3.3 V **Life Test Voltage:** 3.8 V

Est. Field Power Dissipation: 85.8 mWatts **Est. Stress Power Dissipation:** 19 mWatts

Est. Field Tj: 56.8 °C **Est. Stress Tj:** 125.3 °C

Die: 20703A1 **Die Size:** 2.56 x 2.81 mm

Process: 40NM LP **Fab:** UMC-12A

Type: Bluetooth **Density:** N/A

II. 40nm GLL/LP/RF Life Test Failure Rate Calculation

HTOL Stress Temperature - 125 °C

Failure Mechanism	Read Points / Test Results				Modeling Parameters @ 55°C					Avg. Failure Rate FITS @ 55°C, 60% Conf.	
	24 hrs	168 hrs	500 hrs	1000 hrs	Ea eV	TAF	VAF	OAF	MTTF (yrs)	Early Life	Inherent Life
PLASTIC											
Sample Size	2716	2519	1559	1559							
Zero fails, Process ave. Ea	0 *	0	0	0	0.66	71	1	71		88	8
Totals	**0**	**0**	**0**	**0**					**14269**	**88**	**8**

* - Contributes to early life FITS

III. Summary of Stress Test Results

Data From Qualification D22120b:

Stress Test	Stress Condition	Package Type	Sample Size	Num. of Lots	Num. of Fails	Failure Rate %	Comments
Early Life Failure Rate	125°C, Vddnom x 1.15	FCFBGA [1]	96	1	0	0.00	24 Hours
HTOL (EL)	125°C, Vddnom x 1.15	FCFBGA [1]	96	1	0	0.00	192 Hours
HTOL (IL)	125°C, Vddnom x 1.15	FCFBGA [1]	96	1	0	0.00	500 Hours
HTOL (XL)	125°C, Vddnom x 1.15	FCFBGA [1]	96	1	0	0.00	1000 Hours
ESD CDM	N/A	FCFBGA [1]	3	1	Pass 500V		
ESD HBM	N/A	FCFBGA [1]	3	1	Pass 2kV		
ESD MM	N/A	FCFBGA [1]	3	1	Pass 150V		
Latch Up	125°C	FCFBGA [1]	3	1	Pass 200mA		

Generic Reference Data:

Stress Test	Stress Condition	Package Type	Sample Size	Num. of Lots	Num. of Fails	Failure Rate %	Comments
High Temp Bake	(150°C)	FCFBGA [2]	77	1	0	0.00	1000 Hours
Preconditioning	(PC2/260°C, +0°C/-5°C)	FCFBGA [2]	260	1	Passed Jedec L3		
Precon+Temp Cycle	-55°C/125°C	FCFBGA [2]	77	1	0	0.00	1000 Cycles
Precon+Thermal Shock	-55°C/125°C	FCFBGA [2]	77	1	0	0.00	300 Cycles
Precon+uHAST	130°C/85% RH	FCFBGA [2]	77	1	0	0.00	96 Hours

Notes / Justification: 1) Results from Qual D22120b, BCM20734UA1KFFB3G, N/A 40NM LP Bluetooth in 90 Ball FCFBGA (8.5 x 8.5 x 1.05mm)

2) Results from Qual PQ02820, BCM20734UA1KFFB3G in 90 Ball FCFBGA (8.5 x 8.5 x 1.05mm) - Same Product, Package, Assembly Site, and Material Set

Preconditioning Flows: PC2 (JEDEC L3): Bake 125°C, 24hr => Soak @ 30°C/60%RH, 192hr => 3x Reflow

Reliability Tests Performed per Specification Requirements

Stress	Condition	Specification Reference
Early Life Failure Rate	125°C, Vddnom x 1.15	JESD22-A108 / AEC-Q100-008
ESD CDM	N/A	JS002 / AEC-Q100-011
ESD HBM	N/A	JS001 / AEC-Q100-002
ESD MM	N/A	JS001 / AEC-Q100-002
High Temp Bake	(150°C)	JESD22-A103
HTOL (EL)	125°C, Vddnom x 1.15	JESD22-A108
HTOL (IL)	125°C, Vddnom x 1.15	JESD22-A108
HTOL (XL)	125°C, Vddnom x 1.15	JESD22-A108
Latch Up	125°C	JESD78 / AEC Q100-004
Precon+Temp Cycle	-55°C/125°C	JESD22-A104
Precon+Thermal Shock	-55°C/125°C	JESD22-A106
Precon+uHAST	130°C/85% RH	JESD22-A118
Preconditioning	(PC2/260°C, +0°C/-5°C)	J-STD-020
Preconditioning	(PC2/260°C, +0°C/-5°C)	J-STD-020 / EIAJ ED-4701-100 Method 104

IV. Revision History

Document Number: 002-17021

Document Title: QTP #D22120b: BCM20734UA1KFFB3G, Bluetooth 4.1 Compliant Baseband Processor with Integrated 2.4 GHz Transceiver

Rev.	Issue Date	ECN#	Originator	Description
**	10/14/2016	5475757	FCCL	Initial Release.

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