Cypress Semiconductor
Reliability Qualification Report

QTP# D22120f Version **

CYW20707VA2

Qualification of CYW20707VA2, Single-Chip Dual Mode Bluetooth Transceiver / SoC for Embedded Wireless Devices in WLCSP (2.56 x 2.81 x 0.33mm) 36 Ball, Wafer Level Chip Scale Package (WLCSP)

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

Product Description:	CYW20707VA2PKWBG	**Cypress Division:**	IoT Division
	Single-Chip Dual Mode Bluetooth Transceiver / SoC for Embedded Wireless Devices		

Package:	WLCSP	**QTP:**	D22120f		
Description:	(2.56 x 2.81 x 0.33mm) 36 Ball, Wafer Level Chip Scale Package (WLCSP)			**Flammability:**	**O2 Index:**
Assembly:	PTI Taiwan	**Molding Compound:**	N/A	UL-V0	>28
Electrical Test:	ASE Taiwan	**Theta Ja / Psi Jt:**	34 °C/W / 1.3 °C/W		
Substrate/Leadframe:	N/A	**Die Attachment:**	N/A		
Lead Finish:	98.2Sn / 1.8Ag	**Bond Wire:**	N/A		
Comments:					

Est. Field Temperature:	55 °C	**Life Test Temperature:**	125 °C
Est. DC Field Current:	40 mA	**Life Test Dynamic Current:**	10 mA
Est. Field Voltage:	3.3 V	**Life Test Voltage:**	3.6 V
Est. Field Power Dissipation:	132 mWatts	**Est. Stress Power Dissipation:**	36 mWatts
Est. Field Tj:	59.4 °C	**Est. Stress Tj:**	126.2 °C

Die:	20703A2A	**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)	PPM	FIT
PLASTIC											
Sample Size	4852	5238	3840	3746							
Zero fails, Process ave. Ea	0 *	0	0	0	0.7	71	1	71			
Totals	**0**	**0**	**0**	**0**					**38052**	**0**	**3**

* - Contributes to early life FITS

III. Summary of Stress Test Results

Stress Test	Stress Condition	Package Type	Sample Size	Num. of Lots	Num. of Fails	Failure Rate %	Comments
		Generic Reference Data:					
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
High Temp Bake	(150°C)	WLCSP [2]	77	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		
Preconditioning	(PC5/245°C, +0°C/-5°C)	WLCSP [2]	231	1	Passed Jedec L1		
Precon+Temp Cycle	(PC5/245°C, -55°C/125°C)	WLCSP [2]	77	1	0	0.00	500 Cycles
	(PC5/245°C, -55°C/125°C)	WLCSP [2]	77	1	0	0.00	1000 Cycles
Precon+uHAST	(PC5/245°C, Unbiased, 130°C/85% RH)	WLCSP [2]	77	1	0	0.00	96 Hours
Temp Humidity Test	(Unbiased, 85°C/85% RH)	WLCSP [2]	77	1	0	0.00	500 hours
	(Unbiased, 85°C/85% RH)	WLCSP [2]	77	1	0	0.00	300 hours
	(Unbiased, 85°C/85% RH)	WLCSP [2]	77	1	0	0.00	1000 hours

Notes / Justification: 1) Results from Qual D22120a, BCM20704UA1KFFB in 49 Ball FCFBGA (4.5 x 4 x 1mm) - Similar Product and Die Size, Same Process Technology

2) Results from Qual PQ03168, BCM43907KWBG in 316 Ball WLCSP (4.907 x 5.848 x 0.33mm) - Same Assembly Facility and Process Technology

Preconditioning Flows: PC5 (JEDEC L1): Bake 125°C, 24hr => Soak @ 85°C/85%RH, 168hr => 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	(PC5/245°C, -55°C/125°C)	JESD22-A104
Precon+uHAST	(PC5/245°C, Unbiased, 130°C/85% RH)	JESD22-A118
Preconditioning	(PC5/245°C, +0°C/-5°C)	J-STD-020
Temp Humidity Test	(Unbiased, 85°C/85% RH)	JESD22-A101

IV. Revision History

Document Number: 002-22379

Document Title: QTP #D22120f: CYW20707VA2, Single-Chip Dual Mode Bluetooth Transceiver / SoC for Embedded Wireless Devices

Rev.	Issue Date	ECN#	Originator	Description
**	12/12/2017	5991990	FCCL	Initial Release.

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