

# Cypress Semiconductor Package Qualification Report

QTP# 084602 VERSION\*A  
October, 2014

**24-Lead QFN (Quad Flat No-Lead)  
(4 x 4mm)  
NiPdAu, MSL3, 260 °C Reflow,  
CML-RA**

**FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT**  
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## PACKAGE QUALIFICATION HISTORY

<b>QTP Number</b>	<b>Description of Qualification Purpose</b>	<b>Date</b>
084602	Qualify Saw 24-Lead QFN (4x4 mm) NiPdAu, MSL3, 260C Reflow, using QMI-509 Epoxy and CEL9220HF13 Mold Compound assembled at CML-Autoline (RA)	Jan 09

<b>MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION</b>	
<b>Package Designation:</b>	LQ24
<b>Package Outline, Type, or Name:</b>	24-lead Quad Flat No Lead (QFN)
<b>Mold Compound Name/Manufacturer:</b>	CEL9220HF13/ Hitachi
<b>Mold Compound Flammability Rating:</b>	ULV (0)
<b>Mold Compound Alpha Emission Rate:</b>	N/A
<b>Oxygen Rating Index:</b>	N/A
<b>Lead Frame Material:</b>	Copper
<b>Lead Finish, Composition / Thickness:</b>	NiPdAu
<b>Die Backside Preparation</b>	Backgrind
<b>Die Separation Method:</b>	100% Saw
<b>Die Attach Supplier:</b>	Henkel
<b>Die Attach Material:</b>	QMI-509
<b>Die Attach Method:</b>	Epoxy
<b>Bond Diagram Designation:</b>	001-48807
<b>Wire Bond Method:</b>	Thermosonic
<b>Wire Material/Size:</b>	BWGHA3/ 0.8mil
<b>Thermal Resistance Theta JA °C/W :</b>	25.06
<b>Package Cross Section Yes/No:</b>	N/A
<b>Assembly Process Flow:</b>	11-21099
<b>Name/Location of Assembly (prime) facility:</b>	CML-Autoline (RA)
<b>MSL Level:</b>	3
<b>Reflow Profile:</b>	260C

<b>ELECTRICAL TEST/FINISH DESCRIPTION</b>	
Test Location	CML-R

**RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS**

<b>Stress/Test</b>	<b>Test Condition (Temp/Bias)</b>	<b>Result P/F</b>
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V JESD22-C101	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2,200V JEDEC EIA/JESD22-A114	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 5.25V, 85% RH Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs, 30°C/60%RH+ Reflow, 260°C+0, -5°C	P
High Temp Storage	JESD22-A103:150C, no bias	P
Pressure Cooker	JESD22-A102: 121 °C, 100%RH, 15 Psig Precondition: JESD22 Moisture Sensitivity MSL3 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 Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs, 30°C/60%RH+ Reflow, 260°C+0, -5°C	P
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity MSL3 192 Hrs, 30°C/60%RH+ Reflow, 260°C+0, -5°C	P
Ball Shear	JESD22-B116, Cpk : 1.33, Ppk : 1.66	P
Bond Pull	MIL-STD-883 – Method 2011, 1.33, Ppk : 1.66	P
Constructional Analysis	Criteria: Meet external and internal characteristics of Cypress package	P
Die Shear	MIL-STD-883, Method 2019 Per die size: <ul style="list-style-type: none"> <li>• &lt;3000 sq. mils = 1.2 kgf</li> <li>• 30001-5000 sq. mils = 1.2 kgf</li> <li>• &gt;5001 sq. mils = 1.2 kgf</li> </ul>	P
Dye Penetrant Test	Test to determine the existence and extent of cracks, Criteria: No Package Crack	P
Final Visual Inspection	JESD22-B101	P
Internal Visual	MIL-STD-883-2014	P
Physical Dimension	MIL-STD-1835, JESD22-B100	P
Solderability, Steam Aged	J-STD-002, JESD22-B102 95% solder coverage minimum	P
Thermal Shock	MIL-STD-883, Method 1011, Condition B, -55 C to 125C and JESD22-A106, Condition C, -55 C to 125C	P
X-Ray	MIL-STD-883 2012	P



## Reliability Test Data

**QTP #:084602**

<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>
<b>STRESS: ACOUSTIC</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697B	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697C	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697E	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697F	CML-RA	COMP	15	0	
<b>STRESS: BALL SHEAR</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	COMP	15	0	
<b>STRESS: BOND PULL</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	COMP	15	0	
<b>STRESS: CONSTRUCTIONAL ANALYSIS</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	10	0	
<b>STRESS: DIE SHEAR</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	COMP	15	0	
<b>STRESS: DYE PENETRANT TEST</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697B	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697C	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697E	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697F	CML-RA	COMP	15	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL, 500V</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	9	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, 2,200V</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	8	0	



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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>
<b>STRESS: FINAL VISUAL</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	967	0	
CY8C20324 (8C20334CC)	4830863	610847697B	CML-RA	COMP	968	0	
CY8C20324 (8C20334CC)	4830863	610847697C	CML-RA	COMP	967	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	COMP	966	0	
CY8C20324 (8C20334CC)	4830863	610847697E	CML-RA	COMP	968	0	
CY8C20324 (8C20334CC)	4830863	610847697F	CML-RA	COMP	968	0	
<b>STRESS: HIGH TEMP STORAGE</b>							
CY8C21434 (8C21434KAA)	4829344	610840878	CML-RA	500	77	0	
CY8C21434 (8C21434KAA)	4829344	610840878	CML-RA	1000	77	0	
<b>STRESS: HI-ACCEL SATURATION TEST, (130C, 5.25V), 85%RH, PRE COND 192 HR 30C/60%RH, MSL3</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	128	77	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	128	79	0	
<b>STRESS: INTERNAL VISUAL</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	10	0	
<b>STRESS: PHYSICAL DIMENSIONS</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	30	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	COMP	30	0	
<b>STRESS: PRESSURE COOKER TEST (121C, 100%RH), PRE COND 192HRS 30C/60%RH, MSL3</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	168	77	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	168	80	0	
<b>STRESS: SOLDERABILITY</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	3	0	
CY8C20324 (8C20334CC)	4830863	610847697B	CML-RA	COMP	3	0	
CY8C20324 (8C20334CC)	4830863	610847697C	CML-RA	COMP	3	0	
CY8C20324 (8C20334CC)	4830863	610847697E	CML-RA	500	80	0	
CY8C20324 (8C20334CC)	4830863	610847697F	CML-RA	500	80	0	



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<b>STRESS: TC COND. -65C TO 150 C, PRECONDITION 192 HRS 30C/60%RH, MSL3</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	500	77	0	
CY8C20324 (8C20334CC)	4830863	610847697B	CML-RA	500	80	0	
CY8C20324 (8C20334CC)	4830863	610847697B	CML-RA	1000	80	0	
CY8C20324 (8C20334CC)	4830863	610847697C	CML-RA	500	80	0	
CY8C20324 (8C20334CC)	4830863	610847697C	CML-RA	1000	80	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	500	80	0	
<b>STRESS: THERMAL SHOCK</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	200	77	0	
<b>STRESS: X-RAY</b>							
CY8C20324 (8C20334CC)	4830863	610847697A	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697B	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697D	CML-RA	COMP	15	0	
CY8C20324 (8C20334CC)	4830863	610847697E	CML-RA	COMP	15	0	



## Document History Page

Document Title: QTP# 084602: 24-LEAD QFN (QUAD FLAT NO-LEAD) (4 X 4MM) NIPDAU, MSL3, 260C  
REFLOW, CML-RA  
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**	4149253	JYF	Initial Spec Release.
*A	4526545	JYF	Sunset review: Updated QTP title page for template alignment.

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