



Cypress Semiconductor Corporation, 198 Champion Court, San Jose, CA 95134. Tel: (408) 943-2600

## PRODUCT INFORMATION NOTIFICATION

**PIN:** PIN152801

**Date:** July 07, 2015

**Subject:** Revision in Silicon Die for USB 3.0 Hub Controllers (HX3 Family) Products

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**Change Type:** Minor

**Product Information:**

HX3 devices are the USB 3.0 Hub controller family of products which are compliant with the USB 3.0 specifications. HX3 products support Super-Speed (SS), Hi-Speed (HS), Full-Speed (FS), and Low-Speed (LS) on all of the ports. HX3 products have been in production since March 2014. They are certified by USB-IF (TID#330000060).

Cypress is revising the HX3 die to Rev. \*D from Rev. \*C silicon to improve the yield. Cypress will continue to ship the current Rev. \*C silicon version for the next several months, after which HX3 shipments will seamlessly migrate to the Rev. \*D silicon. There are no changes to the ordering part numbers or datasheet parameters.

**Affected Part Numbers:** 27

**Affected Parts:** Refer to attached 'Affected Parts List' file.

**Implementation Date:**

HX3 shipments are expected to migrate to the Rev. \*D silicon in four to six months.

**Anticipated Impact:**

HX3 Rev.\*D silicon products are drop-in compatible with HX3 Rev.\*C silicon products from a functional, parametric, and quality performance perspective.

Although HX3 Rev.\*D Silicon passes USB-IF compliance (TID# 330000060) with internal ROM firmware, it will continue to support the external EEPROM.

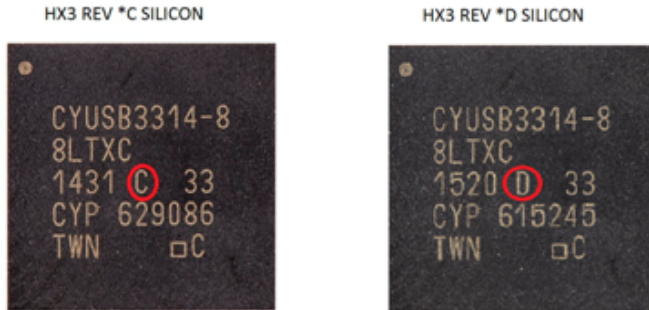
For projects where an external EEPROM with HX3 firmware is used, customers are recommended to use the latest B7 revision of firmware. The B7 firmware is compatible with both Rev. \*C and Rev. \*D silicon revisions. Firmware can be downloaded at [www.cypress.com/hx3](http://www.cypress.com/hx3).

**Qualification Status:**

Rev.\*D silicon products have been qualified through a series of tests detailed on Qualification Test Plan (QTP) 151408. The QTP report can be found as an attachment to this notification or by visiting [www.cypress.com](http://www.cypress.com) and typing the QTP number in the keyword search window.

**Method of Identification:**

Please refer to the picture below for the distinction between the Rev. \*C silicon and the Rev. \*D silicon indication on the package marking (third row, circled in red).



Cypress maintains traceability of product to wafer level, including wafer fabrication location, through the lot number marked on the package.

**Response Required:**

This is an information only announcement. No response is required

For additional information regarding this change, contact your local sales representative or contact the PCN Administrator at [pcn\\_adm@cypress.com](mailto:pcn_adm@cypress.com).

Sincerely,

Cypress PCN Administration

<b>Item No</b>	<b>Affected Marketing Parts</b>
1	CYUSB3302-68LTXC
2	CYUSB3304-68LTXC
3	CYUSB3304-68LTXI
4	CYUSB3312-88LTXC
5	CYUSB3314-88LTXC
6	CYUSB3314-88LTXI
7	CYUSB3326-88LTXC
8	CYUSB3326-88LTXI
9	CYUSB3328-88LTXC
10	CYUSB3324-88LTXI
11	CYUSB3326-88LTXC
12	CYUSB3326-88LTXI
13	CYUSB3328-88LTXC
14	CYUSB3328-88LTXI
15	CYUSB3302-BVXC
16	CYUSB3302-BVXI
17	CYUSB3304-BVXC
18	CYUSB3304-BVXI
19	CYUSB3312-BVXC
20	CYUSB3312-BVXI
21	CYUSB3314-BVXC
22	CYUSB3314-BVXI
23	CYUSB3324-BVXC
24	CYUSB3324-BVXI
25	CYUSB3326-BVXC
26	CYUSB3326-BVXI
27	CYUSB3328-BVXC

# Cypress Semiconductor Product Qualification Report

**QTP# 121306 VERSION\*B  
May, 2015**

<b>HX3 Device Family</b>	
<b>LL65H-25ODR Technology, UMC Fab 12A</b>	
<b>CYUSB33XX</b>	<b>HX3 USB 3.0 HUB</b>

**FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT**  
[reliability@cypress.com](mailto:reliability@cypress.com) or via a CYLINK CRM CASE

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## PRODUCT QUALIFICATION HISTORY

QTP Number	Description of Qualification Purpose	Date
121306	Qualification of HX3 USB3.0 HUB Device 7C07500A in LL65H-25ODR Technology at UMC-12A.	Sept.2013
134101	Qualification of HX3 USB3.0 HUB Device 7C07500A Rev.*A Silicon in LL65H-25ODR Technology at UMC-12A	Dec. 2013
142202	Qualification of HX3 USB3.0 HUB Device 7C07500A Rev.*C Silicon in LL65H-25ODR Technology at UMC-12A	Aug.2014
151408	Qualification of HX3 USB3.0 HUB Device 7C07500A Rev.*D Silicon in LL65H-25ODR Technology at UMC-12A	May 2015



<b>PRODUCT DESCRIPTION</b>	
Qualification Purpose: Qualify HX3 USB3.0 HUB Device 7C07500A in LL65H-25ODR Technology at UMC-12A	
Marketing Part #:	CYUSB33XX
Device Description:	USB HUB Controllers
Cypress Division:	Cypress Semiconductor Corporation – Data Communication Division

<b>TECHNOLOGY/FAB PROCESS DESCRIPTION</b>			
Number of Metal Layers:	6	Metal Composition:	M1 : CU 1.2KA , 100%CU M2 : CU 1.75KA, 100%CU M3 : CU 1.85KA, 100%CU M4 : CU 1.85KA, 100%CU M5 : CU 3.5KA, 100%CU M6 : CU 10.1KA, 100%CU
Passivation Type and Thickness:	SIN 0.07 um + Oxide 1.2 um + PSG 0.4 um + SIN 0.5 um		
Generic Process Technology/Design Rule ( $\mu$ -drawn):	65nm		
Gate Oxide Material/Thickness (MOS):	20 - 55 Angstrom		
Name/Location of Die Fab (prime) Facility:	UMC Fab 12A		
Die Fab Line ID/Wafer Process ID:	LL65H-25ODR		

### PACKAGE AVAILABILITY

PACKAGE	WIRE MATERIAL	ASSEMBLY FACILITY SITE	QTP NUMBER
68 QFN	CuPd	CML-RA	124702
68 & 88 QFN	CuPd	ASE-G	124301

Note: Package Qualification details upon request.

<b>MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION</b>	
Package Designation:	LT68C
Package Outline, Type, or Name:	Quad Flat No Lead (QFN)
Mold Compound Name/Manufacturer:	Sumitomo / GE7470
Mold Compound Flammability Rating:	V-0 UL94
Mold Compound Alpha Emission Rate:	<0.1
Oxygen Rating Index: >28%	54
Lead Frame Designation:	RMP
Lead Frame Material:	Copper
Substrate Material:	N/A
Lead Finish, Composition / Thickness:	NiPdAu
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	Wafer Saw
Die Attach Supplier:	Dexter
Die Attach Material:	QMI 519
Bond Diagram Designation	001-84296
Wire Bond Method:	Thermosonic
Wire Material/Size:	0.8mil / CuPd
Thermal Resistance Theta JA °C/W:	15.92
Package Cross Section Yes/No:	Y
Assembly Process Flow:	11-21099
Name/Location of Assembly (prime) facility:	CML-RA
MSL LEVEL	3
REFLOW PROFILE	260C

<b>ELECTRICAL TEST / FINISH DESCRIPTION</b>	
Test Location:	CML-RA, ASE-G

**Note:** Please contact a Cypress Representative for other package availability.

## RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V/1000V/1250V JESD22-C101	P
Electrostatic Discharge Human Body Model (ESD-HBM)	1100V/2200V/2700V/3000V/3300V JESD22, Method A114	P
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc = 3.77V, 140°C JESD22-A108	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc = 3.77V, 140°C JESD22-A108	P
Pressure Cooker Test	JESD22-A102, 121°C, 100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Static Latch-up	85°C,+/- 140mA 85°C,+/- 200mA 125°C,+/- 140mA JESD 78	P
Temperature Cycle	MIL-STD-883, Method 1010, Condition C, -65°C to 150°C Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P



### RELIABILITY FAILURE RATE SUMMARY

Stress/Test	Device Tested/ Device Hours	# Fails	Activation Energy	Thermal AF <sup>3</sup>	Failure Rate
High Temperature Operating Life Early Failure Rate	1,533	0	N/A	N/A	0 PPM
High Temperature Operating Life Long Term Failure Rate	98,400 DHRs	0	0.7	170	85 FIT**

- <sup>1</sup> Assuming an ambient temperature of 55°C and a junction temperature rise of 15°C.
- <sup>2</sup> Chi-squared 60% estimations used to calculate the failure rate.
- <sup>3</sup> 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<sub>A</sub> =The Activation Energy of the defect mechanism.

K = Boltzmann's constant = 8.62x10<sup>-5</sup> eV/Kelvin.

T<sub>1</sub> is the junction temperature of the device under stress and T<sub>2</sub> is the junction temperature of the device at use conditions.

\*\*Insufficient samples to calculate FIT Rate.



## Reliability Test Data

**QTP #: 121306**

<i>Device</i>	<i>Package</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, MSL3</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	COMP	15	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL(500V)</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	COMP	9	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL(1,000V)</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	COMP	3	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL(1,250V)</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (1,100V)</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (2,200V)</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	COMP	8	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (3,300V)</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	COMP	3	0	
<b>STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (140C, 3.77V, Vcc Max)</b>								
CYUSB3304 (7CP07501B)	LT68C	9313002	611317473	CML-RA	72	1533	0	
<b>STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (140C, 3.77V, Vcc Max)</b>								
CYUSB3304 (7CP07501B)	LT68C	9313002	611317473	CML-RA	96	164	0	
CYUSB3304 (7CP07501B)	LT68C	9313002	611317473	CML-RA	500	164	0	
CYUSB3304 (7CP07501B)	LT68C	9313002	611317473	CML-RA	600	164	0	
<b>STRESS: PRE/POST LFR PARAMATER ASSESSMENT</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	0	30+2	0	
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	600	30+2	0	
<b>STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR 30C/60%RH (MSL3)</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	168	77	0	
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	288	77	0	



## Reliability Test Data

### QTP #: 121306

<i>Device</i>	<i>Package</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: STATIC LATCH-UP TESTING (85C, 1.89/5.44/7.84V, +/-140mA)</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	COMP	3	0	
<b>STRESS: TEMPERATURE CYCLE (COND. C, -65C TO 150C), PRE COND 192 HR 30C/60%RH (MSL3)</b>								
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	500	78	0	
CYUSB3304 (7CP07501A)	LT68C	9313002	611321399	CML-RA	1000	77	0	



## Reliability Test Data

### QTP #: 134101

<i>Device</i>	<i>Package</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: ESD-CHARGE DEVICE MODEL(500V)</b>								
CYUSB3304 (7CP07501A)	LT68B	9314001	611341922	CML-RA	COMP	9	0	
CYUSB3314 (7CP07500A)	LT68B	9314001	611341921	CML-RA	COMP	9	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL(1,000V)</b>								
CYUSB3304 (7CP07501A)	LT68B	9314001	611341922	CML-RA	COMP	3	0	
CYUSB3314 (7CP07500A)	LT68B	9314001	611341921	CML-RA	COMP	3	0	
<b>STRESS: ESD-CHARGE DEVICE MODEL(1,250V)</b>								
CYUSB3304 (7CP07501A)	LT68B	9314001	611341922	CML-RA	COMP	3	0	
CYUSB3314 (7CP07500A)	LT68B	9314001	611341921	CML-RA	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (1,100V)</b>								
CYUSB3304 (7CP07501A)	LT68B	9314001	611342152	CML-RA	COMP	3	0	
CYUSB3314 (7CP07500A)	LT68B	9314001	611341921	CML-RA	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (2,200V)</b>								
CYUSB3304 (7CP07501A)	LT68B	9314001	611342152	CML-RA	COMP	8	0	
CYUSB3314 (7CP07500A)	LT68B	9314001	611341921	CML-RA	COMP	8	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (3,300V)</b>								
CYUSB3304 (7CP07501A)	LT68B	9314001	611342152	CML-RA	COMP	3	0	
<b>STRESS: STATIC LATCH-UP TESTING (85C, 1.98V/5.44V/7.87V, +/-140mA)</b>								
CYUSB3304 (7CP07501A)	LT68B	9314001	611342152	CML-RA	COMP	6	0	
CYUSB3314 (7CP07500A)	LT68B	9314001	611341921	CML-RA	COMP	6	0	



## Reliability Test Data

### QTP #: 142202

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (1,100V)</b>								
CYUSB3304 (7CP07501C)	LT68B	9340014	611429262	CML-RA	COMP	3	0	
CYUSB3314 (7CP07500C)	LT88B	9340014	611429086	G-Taiwan	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (2,200V)</b>								
CYUSB3304 (7CP07501C)	LT68B	9340014	611429262	CML-RA	COMP	8	0	
CYUSB3314 (7CP07500C)	LT88B	9340014	611429086	G-Taiwan	COMP	8	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (2,700V)</b>								
CYUSB3304 (7CP07501C)	LT68B	9340014	611429262	CML-RA	COMP	3	0	
CYUSB3314 (7CP07500C)	LT88B	9340014	611429086	G-Taiwan	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (3,000V)</b>								
CYUSB3304 (7CP07501C)	LT68B	9340014	611429262	CML-RA	COMP	3	0	
CYUSB3314 (7CP07500C)	LT88B	9340014	611429086	G-Taiwan	COMP	3	0	
<b>STRESS: STATIC LATCH-UP TESTING (85C, 1.89V/5.44V/7.87V, +/-140mA)</b>								
CYUSB3304 (7CP07501C)	LT68B	9340014	611429262	CML-RA	COMP	6	0	
<b>STRESS: STATIC LATCH-UP TESTING (85C, 1.89V/5.44V/7.87V, +/-200mA)</b>								
CYUSB3304 (7CP07501C)	LT68B	9340014	611429262	CML-RA	COMP	3	0	
<b>STRESS: STATIC LATCH-UP TESTING (125C, 1.89V/5.44V/7.87V, +/-140mA)</b>								
CYUSB3304 (7CP07501C)	LT68B	9340014	611429262	CML-RA	COMP	3	0	
<b>YIELD: SORT</b>								
CYUSB3304 (7CP07501A)	LT68B	9314001	611342152	CML-RA	COMP	EQUIVALENT		
<b>YIELD: CLASS</b>								
CYUSB3304 (7CP07501A)	LT68B	9314001	611342152	CML-RA	COMP	EQUIVALENT		



## Reliability Test Data

### QTP #: 151408

Device	Package	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (1,100V)</b>								
CYUSB3304 (7CP07501D)	LT68B	9509001	611515436	CML-RA	COMP	3	0	
<b>STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, (2,200V)</b>								
CYUSB3304 (7CP07501D)	LT68B	9509001	611515436	CML-RA	COMP	8	0	
<b>STRESS: STATIC LATCH-UP TESTING (85C, 1.89V/5.44V/7.87V, +/-140mA)</b>								
CYUSB3304 (7CP07501D)	LT68B	9509001	611515436	CML-RA	COMP	3	0	
<b>STRESS: STATIC LATCH-UP TESTING (85C, 2.08V/5.99V/8.66V, +/-200mA)</b>								
CYUSB3304 (7CP07501D)	LT68B	9509001	611515436	CML-RA	COMP	3	0	
<b>STRESS: STATIC LATCH-UP TESTING (125C, 1.89V/5.44V/7.87V, +/-140mA)</b>								
CYUSB3304 (7CP07501D)	LT68B	9509001	611515436	CML-RA	COMP	3	0	
<b>YIELD: SORT</b>								
CYUSB3304 (7CP07501D)	LT68B	9509001	611515436	CML-RA	COMP			EQUIVALENT
<b>YIELD: CLASS</b>								
CYUSB3304 (7CP07501D)	LT68B	9509001	611515436	CML-RA	COMP			EQUIVALENT
CYUSB3314 (7CP07500D)	LT88B	9509001	611515245	CML-RA	COMP			EQUIVALENT



## Document History Page

Document Title: QTP#121306: HX3 DEVICE FAMILY (CYUSB33XX) LL65H-25ODR TECHNOLOGY,UMC FAB  
12A QUALIFICATION REPORT  
Document Number: 001-91243

Rev.	ECN No.	Orig. of Change	Description of Change
**	4293693	JYF	Initial release.
*A	4481271	JYF	Updated QTP title page for template alignment. Added HX3 Rev.*C qualification data (QTP#142202).
*B	4779540	JYF	Updated reference for Reliability Director in QTP title page; Added HX3 Rev.*D qualification data (QTP#151408).

Distribution: WEB

Posting: None