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Cypress Semiconductor Product Qualification Report

QTP# 064302 VERSION*C
June, 2014

XO LN FLEXO DEVICE FAMILY L8C-3R TECHNOLOGY, FAB 4	
CY2VC521	Low Noise LVDS Clock Generator with VCXO
CY2VC511	27 MHZ Clock Generator with VCXO
CY2XP01	Fibre Channel Crystal to LVPECL Clock Generator
CY2XP11	106.25MHz / 100MHz Crystal to LVPECL Clock Generator
CY2XP21	125 MHZ LVPECL Clock Generator
CY2XP22/24/41/51	Crystal to LVPECL Clock Generator
CY2XP31	312.5 MHZ LVPECL Clock Generator
CY2XP81	Crystal to LVPECL Clock Generator with Frequency Margining – I2C Control
CY2XP91	Crystal to LVPECL Clock Generator with Frequency Margining – Pin Control
CY2XL01	Fibre Channel Crystal to LVDS Clock Generator
CY2XL11	100 MHZ LVDS Clock Generator
CY2XL22/23/31/51	Crystal to LVDS Clock Generator
CY2XL71	Sata/SAS Crystal to LVDS Clock Generator
CY2X013	LVDS Crystal Oscillator (XO)
CY2X012	Low Jitter Crystal Oscillator
CY2X014	Low Jitter LVPECL Crystal Oscillator

XO LN FLEXO DEVICE FAMILY L8C-3R TECHNOLOGY, FAB 4	
CY2XF23	High Performance LVDS Oscillator With Frequency Margining - I2C Control
CY2XF24	High Performance LVPECL Oscillator With Frequency Margining - I2C Control
CY2XF32	High Performance CMOS Oscillator With Frequency Margining - Pin Control
CY2XF33	High Performance LVDS Oscillator With Frequency Margining - Pin Control
CY2XF34	High Performance LVPECL Oscillator With Frequency Margining - Pin Control
CY2V014	LVPECL Voltage Controlled Crystal Oscillator (VCXO)
CY2V013	Low Jitter LVDS Voltage Controlled Crystal Oscillator
CY2V012	Voltage Controlled Crystal Oscillator
CY2XP61	125 MHZ LVPECL Clock Generator
CY2X0147	Low jitter LVPECL crystal oscillator
CY2X0137	High performance LVDS crystal oscillator
CY2XF327	High performance CMOS crystal oscillator

FOR ANY QUESTIONS ON THIS REPORT, PLEASE CONTACT
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PRODUCT QUALIFICATION HISTORY

Qual Report	Description of Qualification Purpose	Date Comp
042106	7C82877A DDR2 PLL New Device family on New C8Q-3R Technology, Fab4	Jan 05
053301	Qualify L8C-3R Technology Derivative of the C8 Technology at Fab4 using CY5077 Device	Sep 06
064302	Qualify XO LN Flexo Product Family on L8C-3R process at Fab4	Jun 09
091601	Qualification of Flexo LN CG PKG Derivatives (7C851012A & 7C851202A) in L8C-3R process at CMI	Jul 09
093101	Qualification of 7C851203A and 7C851204A Bond Option of Flexo Device	Aug 09
092803	Qualification of 4-Layer Minor Design Change on Flexo Device 7C85100A/ 110A/120A L8C-3R fabricated in Fab4	Sep 09
120105	Qualification of 24L QFN new package option of 7C851300A FLEXO Die (7C85120A, base die: 7C85100A), L8C-3R Technology in Fab 4.	June 13

PRODUCT DESCRIPTION (for qualification)	
Qualification Purpose: Qualify XO LN Flexo Product Family on L8C-3R process at Fab4	
Marketing Part #:	CY2VC521xx, CY2VC511xx, CY2XP01xx, CY2XP11xx, CY2XP21xx, CY2XP22xx, CY2XP24xx, CY2XP31xx, CY2XP41xx, CY2XP51xx, CY2XP81xx, CY2XP91xx, CY2XL01xx, CY2XL11xx, CY2XL22xx, CY2XL23xx, CY2XL31xx, CY2XL51xx, CY2XL71xx, CY2X013xx, CY2X012xx, CY2X014xx, CY2XF23xx, CY2XF24xx, CY2XF32xx, CY2XF33xx, CY2XF34xx, CY2V014xx, CY2V013xx, CY2V012xx, CY2XP61xx, CY2X0147xx, CY2X0137xx, CY2XF327xx
Device Description:	Low Noise XO/VCXO/VCO Crystal Oscillator and Clock Generator
Cypress Division:	Cypress Semiconductor Corporation – MPD

TECHNOLOGY/FAB PROCESS DESCRIPTION			
Number of Metal Layers:	4	Metal Composition:	Metal 1: 100A Ti/3,200A Al /300A TiW Metal 2: 150A Ti/4,230A Al /300A TiW Metal 3: 150A Ti/4,230A Al /300A TiW Metal 4: 150A Ti/8,000A Al /300A TiW
Passivation Type and Thickness:		TEOS 1,000A / 7,000A Si ₃ N ₄	
Generic Process Technology/Design Rule (μ-drawn):		CMOS, 0.13 μm	
Gate Oxide Material/Thickness (MOS):		SiO ₂ DGOX 32/55A	
Name/Location of Die Fab (prime) Facility:		CMI / Bloomington MN	
Die Fab Line ID/Wafer Process ID:		Fab4, L8C-3R	

PACKAGE AVAILABILITY

PACKAGE	ASSEMBLY FACILITY SITE
16-Pin TSSOP	CML-RA
8-Pin TSSOP	OSE-TAIWAN
6-Pin (5x3.2mm/5x7mm) / 4-Pin LCC	ECERA-TAIWAN
24-Pin QFN	ASE-TAIWAN

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	ZZ16, ZZ08
Package Outline, Type, or Name:	16-Lead Thin Shrunk Small Outline Package (TSSOP) 8-Lead Thin Shrunk Small Outline Package (TSSOP)
Mold Compound Name/Manufacturer:	CEL 9200 / Hitachi, CEL 9200HF / Hitachi
Mold Compound Flammability Rating:	UL-94 V-0
Mold Compound Alpha Emission Rate	N/A
Oxygen Rating Index:	N/A
Lead Frame Material:	Copper
Lead Finish, Composition / Thickness:	NiPdAu
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	100% Saw
Die Attach Supplier:	Henkel , Hitachi
Die Attach Material:	QMI 509, 4900G
Die Attach Method:	Epoxy
Bond Diagram Designation:	001-13744
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au, 1.0mil, Au, 1.2mil
Thermal Resistance Theta JA °C/W:	117°C/W, 135°C/W
Package Cross Section Yes/No:	N/A
Assembly Process Flow:	11-20028, 001-04375
Name/Location of Assembly (prime) facility:	CML-RA, OSE-T
MSL Level	3
Reflow Profile	260C

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

Note: Please contact a Cypress Representative for other packages availability.

MAJOR PACKAGE INFORMATION USED IN THIS QUALIFICATION	
Package Designation:	LZ04, LZ06
Package Outline, Type, or Name:	4 - Leadless Chip Carrier (LCC) 6 – Leadless Chip Carrier (LCC)
Mold Compound Name/Manufacturer:	N/A
Mold Compound Flammability Rating:	N/A
Oxygen Rating Index:	N/A
Lead Frame Material:	N/A
Lead Finish, Composition / Thickness:	Ni / Au
Die Backside Preparation Method/Metallization:	Backgrind
Die Separation Method:	100% Saw
Die Attach Supplier:	Threebond
Die Attach Material:	3301F
Die Attach Method:	Epoxy
Bond Diagram Designation:	001-14533
Wire Bond Method:	Thermosonic
Wire Material/Size:	Au, 1.0mil
Thermal Resistance Theta JA °C/W:	66 °C/W / 62 °C/W
Package Cross Section Yes/No:	N/A
Assembly Process Flow:	001-07965
Name/Location of Assembly (prime) facility:	eCERA
MSL Level	N/A
Reflow Profile	N/A

ELECTRICAL TEST / FINISH DESCRIPTION	
Test Location:	eCERA
Fault Coverage:	100%

RELIABILITY TESTS PERFORMED PER SPECIFICATION REQUIREMENTS

Stress/Test	Test Condition (Temp/Bias)	Result P/F
High Temperature Operating Life Early Failure Rate	Dynamic Operating Condition, Vcc Max=3.8V, 125°C Dynamic Operating Condition, Vcc Max=2.35V, 150°C Dynamic Operating Condition, Vcc Max=2.35V, 125°C Dynamic Operating Condition, Vcc Max=3.96V, 125°C JESD22-A108	P
High Temperature Operating Life Latent Failure Rate	Dynamic Operating Condition, Vcc Max=3.8V, 125°C Dynamic Operating Condition, Vcc Max=2.35V, 150°C Dynamic Operating Condition, Vcc Max=2.35V, 125°C JESD22-A108	P
Long Life Verification	Dynamic Operating Condition, Vcc Max=2.35V, 150°C JESD22-A108	P
Low Temperature Operating Life	Dynamic Operating Condition, Vcc = 4.3V, -30°C, f = 4MHz JESD22-A108	P
High Temperature Steady State life	Static Operating Condition, 125°C, 2.35V/3.63V, Vcc Max JESD22-A108	P
High Accelerated Saturation Test (HAST)	JEDEC STD 22-A110: 130°C, 85%RH, 1.8V/2.35V/3.63V Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	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
Pressure Cooker	JESD22-A102, 121°C, 100%RH, 15 PSIG Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2200V MIL-STD-883, Method 3015.7	P
Electrostatic Discharge Human Body Model (ESD-HBM)	2200V JESD22, Method A114	P
Electrostatic Discharge Charge Device Model (ESD-CDM)	500V, JESD22-C101	P
Age Bond Strength	200°C, 4hrs MIL-STD-883, Method 883-2011	P
Ball Shear	JESD22-B116, Cpk : 1.33, Ppk : 1.66	P
Acoustic Microscopy	J-STD-020 Precondition: JESD22 Moisture Sensitivity Level (192 Hrs., 30°C, 60% RH, 260°C Reflow)	P
Dynamic Latch-up	6.9V, In accordance with JESD78	P
High Temperature Storage	JESD22-A103:150, no bias	P
Latch up Sensitivity	125°C, ± 200mA/300mA, In accordance with JESD78 85°C, ± 140mA/180mA, In accordance with JESD78	P

RELIABILITY FAILURE RATE SUMMARY

Stress/Test	Device Tested/ Device Hours	# Fails	Activation Energy	Thermal ³ A.F	Failure Rate
High Temperature Operating Life Early Failure Rate ¹	3837 Devices	0	N/A	N/A	0 PPM
High Temperature Operating Life ^{1,2} Long Term Failure Rate (150C)	180,000 DHRs	0	0.7	170	12 FIT
High Temperature Operating Life ^{1,2} Long Term Failure Rate (125C)	860,000 DHRs	0	0.7	55	

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 #: 042106

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: ACOUSTIC-MSL3

CY68013A (7C681000A)	4416666	610434406	TAIWN-G	COMP	17	0	
CY2SSTU877 (7C87741A)	4416666B	H20592	TAIWN-G	COMP	16	0	
CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	COMP	17	0	
CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	COMP	16	0	

STRESS: AGE BOND STRENGTH

CY68013A (7C681000A)	4416666	610434406	TAIWN-G	COMP	5	0	
CY68013A (7C682001A)	4416701	610437657	TAIWN-G	COMP	5	0	
CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	COMP	3	0	

STRESS: BALL SHEAR

CY68013A (7C682001A)	4416701	610437657	TAIWN-G	COMP	5	0	
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STRESS: DYNAMIC LATCH-UP TESTING (6.9V)

CY68013A (7C682001A)	4416701	610437657	TAIWN-G	COMP	3	0	
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STRESS: ESD-CHARGE DEVICE MODEL (500V)

CY68013A (7C682001A)	4416666	610437607	TAIWN-G	COMP	9	0	
CY68013A (7C682000A)	4416666	610437102	TAIWN-G	COMP	9	0	
CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	COMP	9	0	
CY68013A (7C682000A)	4416701	610437702	TAIWN-G	COMP	9	0	
CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	COMP	9	0	

STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, 2200V

CY68013A (7C682001A)	4416666	610437607	TAIWN-G	COMP	9	0	
CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	COMP	9	0	
CY2SSTU877 (7C82877A)	4413035	H19747	TAIWN-G	COMP	9	0	
CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	COMP	9	0	

STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2200V

CY68013A (7C682001A)	4416666	610437607	TAIWN-G	COMP	3	0	
CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	COMP	3	0	
CY2SSTU877 (7C82877A)	4413035	H19747	TAIWN-G	COMP	3	0	
CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	COMP	3	0	

Reliability Test Data

QTP #: 042106

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: HIGH TEMP STEADY STATE LIFE TEST (150C, 3.63V)

CY68013A (7C682005A)	4416701	610438121	TAIWN-G	80	80	0	
CY68013A (7C682005A)	4416701	610438121	TAIWN-G	168	80	0	

STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (125C, 3.8V, Vcc Max)

CY68013A (7C682001A)	4416666	610437607	TAIWN-G	96	499	0	
CY68013A (7C682005A)	4417143	610443845	TAIWN-G	96	514	0	

STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (125C, 3.8V, Vcc Max)

CY68013A (7C682001A)	4416666	610437607	TAIWN-G	168	200	0	
CY68013A (7C682001A)	4416666	610437607	TAIWN-G	1000	194	0	
CY68013A (7C682005A)	4417143	610443845	TAIWN-G	168	208	0	
CY68013A (7C682005A)	4417143	610443845	TAIWN-G	1000	208	0	

STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (125C, 2.35V, Vcc Max)

CY2SSTU877 (7C87741A)	4416666B	H20592	TAIWN-G	96	276	0	
CY2SSTU877 (7C82877A)	4416701	H20501	TAIWN-G	96	126	0	
CY2SSTU877 (7C87741A)	4416701	H20500	TAIWN-G	96	89	0	
CY2SSTU877 (7C87740A)	4416791B	H20536	TAIWN-G	96	169	0	
CY2SSTU877 (7C87741A)	4417975	H20583	TAIWN-G	96	304	0	
CY2SSTU877 (7C87741A)	4419587	H20650	TAIWN-G	96	500	0	

STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (125C, 3.8V, Vcc Max)

CY2SSTU877 (7C87741A)	4416666B	H20592	TAIWN-G	1000	253	0	
CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	168	150	0	
CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	1000	150	0	

STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 3.63V), PRE COND 192 HR, 30C/60%RH, MSL3

CY68013A (7C682001A)	4416666	610437607	TAIWN-G	128	47	0	
CY68013A (7C682001A)	4416666	610437607	TAIWN-G	256	47	0	
CY68013A (7C682000A)	4416701	610437702	TAIWN-G	128	47	0	
CY68013A (7C682000A)	4416701	610437702	TAIWN-G	256	45	0	

STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 1.8V), PRE COND 192 HR, 30C/60%RH, MSL3

CY2SSTU877 (7C87741A)	4417975	H20583	TAIWN-G	128	43	0	
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Reliability Test Data

QTP #: 042106

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: LOW TEMPERATURE OPERATING LIFE (-30C, 4.3V)

CY68013A (7C682005A)	4416701	610438121	TAIWN-G	500	80	0	
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STRESS: STATIC LATCH-UP TESTING (125C, 5.5V, ±300mA)

CY2SSTU877 (7C82877A)	4413035	H19747	TAIWN-G	COMP	3	0	
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CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	COMP	3	0	
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STRESS: STATIC LATCH-UP TESTING (125C, 6.5V, ±300mA)

CY68013A (7C682001A)	4416666	610437607	TAIWN-G	COMP	3	0	
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STRESS: STATIC LATCH-UP TESTING (125C, 7.5V, ±300mA)

CY68013A (7C682001A)	4416701	610437657	TAIWN-G	COMP	3	0	
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STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR, 30C/60%RH, MSL3

CY68013A (7C681000A)	4416666	610434406	TAIWN-G	168	50	0	
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CY68013A (7C681000A)	4416666	610434406	TAIWN-G	288	50	0	
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CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	168	50	0	
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CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	288	50	0	
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CY2SSTU877 (7C82877A)	4413035	H19747	TAIWN-G	168	47	0	
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CY2SSTU877 (7C82877A)	4413035	H19747	TAIWN-G	288	47	0	
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CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	168	45	0	
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CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	288	45	0	
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STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS, 30C/60%RH, MSL3

CY68013A (7C681000A)	4416666	610434406	TAIWN-G	300	50	0	
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CY68013A (7C681000A)	4416666	610434406	TAIWN-G	500	50	0	
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CY68013A (7C681000A)	4416666	610434406	TAIWN-G	1000	50	0	
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CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	168	50	0	
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CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	500	50	0	
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CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	1000	50	0	
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CY2SSTU877 (7C82877A)	4413035	H19747	TAIWN-G	300	46	0	
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CY2SSTU877 (7C82877A)	4413035	H19747	TAIWN-G	500	45	0	
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CY2SSTU877 (7C82877A)	4413035	H19747	TAIWN-G	1000	45	0	
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CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	300	45	0	
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Reliability Test Data

QTP #: 042106

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS, 30C/60%RH, MSL3 (CONTINUATION)

CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	500	45	0	
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CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	1000	45	0	
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STRESS: HIGH TEMPERATURE STORAGE, 150C, no bias

CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	500	50	0	
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CY68013A (7C681000A)	4416701	610434407/8	TAIWN-G	1000	50	0	
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CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	500	45	0	
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CY2SSTU877 (7C87740A)	4417143	H20549	TAIWN-G	1000	45	0	
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Reliability Test Data

QTP #: 053301

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ACOUSTIC-MSL3							
CY5077 (7C850003A)	4538565	610555083	CML-RA	COMP	16	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	COMP	15	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	COMP	15	0	
STRESS: DYNAMIC LATCH-UP, 5.0V							
CY5077 (7C850003A)				COMP	2	0	
STRESS: DYNAMIC LATCH-UP, 6.25V							
CY5077 (7C850003A)				COMP	2	0	
STRESS: ESD-CHARGE DEVICE MODEL (500V)							
CY5077 (7C850003A)	4538565	610555083	CML-RA	COMP	9	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	COMP	9	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	COMP	9	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, 2200V							
CY5077 (7C850003A)	4538565	610555083	CML-RA	COMP	9	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	COMP	9	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	COMP	3	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER MIL STD 883, METHOD 3015, 2200V							
CY5077 (7C850003A)	4538565	610555083	CML-RA	COMP	3	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	COMP	3	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	COMP	3	0	
STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (150C, 2.35V, Vcc Max)							
CY5077 (7C850003A)	4538565	610555083	CML-RA	48	519	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	48	1061	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	48	500	0	
STRESS: HIGH TEMP STEADY STATE LIFE TEST (150C, 2.35V)							
CY5077 (7C850003A)	4538565	610555083	CML-RA	80	79	0	
CY5077 (7C850003A)	4538565	610555083	CML-RA	168	79	0	

Reliability Test Data

QTP #: 053301

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (150C, 2.35V, Vcc Max)

CY5077 (7C850003A)	4538565	610555083	CML-RA	80	120	0	
CY5077 (7C850003A)	4538565	610555083	CML-RA	500	120	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	80	120	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	500	120	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	80	120	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	500	120	0	

STRESS: LONG LIFE VERIFICATION TEST (150C, 2.35V, Vcc Max)

CY5077 (7C850003A)	4538565	610555083	CML-RA	1000	119	0	
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STRESS: HI-ACCEL SATURATION TEST (130C, 85%RH, 2.35V), PRE COND 192 HR, 30C/60%RH, MSL3

CY5077 (7C850003A)	4538565	610555083	CML-RA	128	48	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	128	48	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	256	47	0	

STRESS: HIGH TEMPERATURE STORAGE, 150C, no bias

CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	500	50	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	1000	50	0	

STRESS: STATIC LATCH-UP TESTING (125C, 3.0V, ±200mA), 1.8V Option

CY5077 (7C850003A)	4538565	610555083	CML-RA	COMP	3	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	COMP	3	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	COMP	3	0	

STRESS: STATIC LATCH-UP TESTING (125C, 6.5V, ±200mA), 3.3V Option

CY5077 (7C850003A)	4538565	610555083	CML-RA	COMP	3	0	
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STRESS: STATIC LATCH-UP TESTING (125C, 5.4V, ±200mA), 3.3V Option

CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	COMP	3	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	COMP	3	0	

Reliability Test Data

QTP #: 053301

<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>
STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS, 30C/60%RH, MSL3							
CY5077 (7C850003A)	4538565	610555083	CML-RA	300	50	0	
CY5077 (7C850003A)	4538565	610555083	CML-RA	500	50	0	
CY5077 (7C850003A)	4538565	610555083	CML-RA	1000	50	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	300	50	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	500	50	0	
CY5077 (7C850003A)	4550443	61033232/3/915	PHIL-M	1000	50	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	300	49	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	500	49	0	
CY5077 (7C850003A)	4615715	610637084	PHIL-M	1000	48	0	

Reliability Test Data

QTP #: 064302

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: ESD-CHARGE DEVICE MODEL (500V)

CY2VC521ZXC (7C851101AC)	4803399	610820272/270/271	CML-RA	COMP	9	0	
CY2X012FLX (7C851001A)	4843328	610853236	ER	COMP	9	0	
CY2V0122FLXC (7C851003A)	4843328	610853238	ER	COMP	9	0	
CY2V013FLXI (7C851004A)	4843328	610853239	ER	COMP	9	0	
CY2X014FLXC (7C851002A)	4843328	610853237	ER	COMP	9	0	
CY2VC521ZXC-2 (7C851101A)	4903174	610906515/16	ER	COMP	9	0	
CY2VC511ZXC (7C851100A)	4903174	610906511/12/13	ER	COMP	9	0	
CY2XP31ZXI (7C851200A)	4903174	610908073/75/77	T-Taiwan	COMP	9	0	
CY2XL11ZXC (7C851201A)	4903174	610908081/82/83	T-Taiwan	COMP	9	0	
CY2X014FLXC (7C851002A)	4903174	610906619	ER	COMP	9	0	
CY2V013FLXI (7C851004A)	4903174	610906625	ER	COMP	9	0	
CY2V012FLXI (7C851003A)	4903174	610906623	ER	COMP	9	0	
CY2X012FLXC (7C851001A)	4903174	610906621	ER	COMP	9	0	
CY2VC511ZXC (7C851100A)	4803399	610820266/265/263	CML-RA	COMP	9	0	
CY2VC511ZXC (7C851001A)	4803399	610818852	ER	COMP	9	0	
CY2X014FLXCT (7C851002A)	4803399	610818855	ER	COMP	9	0	
CY2V012FLXCT (7C851003A)	4803399	610818854	ER	COMP	9	0	
CY2V013FLXIT (7C851004A)	4803399	610818851	ER	COMP	9	0	
CY2XP31ZXC (7C851010A)	4803399	610818851	ER	COMP	9	0	

STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, 2200V

CY2VC521ZXC (7C851101AC)	4803399	610820272/270/271	CML-RA	COMP	8	0	
CY2X012FLX (7C851001A)	4843328	610853236	ER	COMP	8	0	
CY2V0122FLXC (7C851003A)	4843328	610853238	ER	COMP	8	0	
CY2V013FLXI (7C851004A)	4843328	610853239	ER	COMP	8	0	
CY2X014FLXC (7C851002A)	4843328	610853237	ER	COMP	8	0	
CY2VC521ZXC-2 (7C851101A)	4903174	610906515/16	ER	COMP	8	0	
CY2VC511ZXC (7C851100A)	4903174	610906511/12/13	ER	COMP	8	0	
CY2XP31ZXI (7C851200A)	4903174	610908073/75/77	T-Taiwan	COMP	8	0	
CY2XL11ZXC (7C851201A)	4903174	610908081/82/83	T-Taiwan	COMP	8	0	

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Reliability Test Data

QTP #: 064302

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, 2200V (CONTINUATION)

CY2X014FLXC (7C851002A)	4903174	610906619	ER	COMP	8	0	
CY2V013FLXI (7C851004A)	4903174	610906625	ER	COMP	8	0	
CY2V012FLXI (7C851003A)	4903174	610906623	ER	COMP	8	0	
CY2X012FLXC (7C851001A)	4903174	610906621	ER	COMP	8	0	
CY2VC511ZXC (7C851100A)	4803399	610820266/265/263	CML-RA	COMP	8	0	
CY2VC511ZXC (7C851001A)	4803399	610818852	ER	COMP	8	0	
CY2X014FLXCT (7C851002A)	4803399	610818855	ER	COMP	8	0	
CY2V012FLXCT (7C851003A)	4803399	610818854	ER	COMP	8	0	
CY2V013FLXIT (7C851004A)	4803399	610818851	ER	COMP	8	0	
CY2XP31ZXC (7C851010A)	4803399	610818851	ER	COMP	8	0	

STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-LATENT FAILURE RATE (125C, 2.35V, Vcc Max)

CY2FLEXO-LV (7C851009A)	4903174	610906225/28/33	CML-R	168	624	0	
CY2FLEXO-LV (7C851009A)	4903174	610906225/28/33	CML-R	1000	624	0	
CY2FLEXO-LV (7C851009A)	4803399	610818721/715/705	CML-R	168	120	0	
CY2FLEXO-LV (7C851009A)	4803399	610818721/715/705	CML-R	1000	120	0	
CY2FLEXO-LV (7C851009A)	4843328	610853381/9/4	CML-R	168	116	0	
CY2FLEXO-LV (7C851009A)	4843328	610853381/9/4	CML-R	1000	116	0	

STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (125C, 2.35V, Vcc Max)

CY2FLEXO-LV (7C851009A)	4903174	610906225/28/33	CML-R	96	1500	0	
CY2FLEXO-LV (7C851009A)	4803399	610818721/715/705	CML-R	96	1006	0	
CY2FLEXO-LV (7C851009A)	4843328	610853381/9/4	CML-R	96	1238	0	

STRESS: HIGH TEMP DYNAMIC OPERATING LIFE-EARLY FAILURE RATE (125C, 3.96V, Vcc Max)

CY2FLEXO-HV (7C851010A)	4903174	610906226	CML-R	96	48	0	
CY2FLEXO-HV (7C851010A)	4843328	610853387/85/80	CML-R	96	45	0	

STRESS: PRESSURE COOKER TEST (121C, 100%RH), 15 Psig, PRE COND 192 HR, 30C/60%RH, MSL3

CY2VC521ZXC (7C851101AC)	4803399	610820272/270/271	CML-RA	168	80	0	
CY2VC521ZXC (7C851101AC)	4803399	610820272/270/271	CML-RA	288	72	0	

Reliability Test Data

QTP #: 064302

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: STATIC LATCH-UP TESTING (125C, ±200mA)

CY2VC521ZXC (7C851101AC)	4803399	610820272/270/271	CML-RA	COMP	6	0	
CY2X012FLX (7C851001A)	4843328	610853236	ER	COMP	6	0	
CY2V0122FLXC (7C851003A)	4843328	610853238	ER	COMP	6	0	
CY2V013FLXI (7C851004A)	4843328	610853239	ER	COMP	6	0	
CY2X014FLXC (7C851002A)	4843328	610853237	ER	COMP	6	0	
CY2VC521ZXC-2 (7C851101A)	4903174	610906515/16	ER	COMP	6	0	
CY2VC511ZXC (7C851100A)	4903174	610906511/12/13	ER	COMP	6	0	
CY2XP31ZXI (7C851200A)	4903174	610908073/75/77	T-Taiwan	COMP	6	0	
CY2XL11ZXC (7C851201A)	4903174	610908081/82/83	T-Taiwan	COMP	6	0	
CY2X014FLXC (7C851002A)	4903174	610906619	ER	COMP	6	0	
CY2V013FLXI (7C851004A)	4903174	610906625	ER	COMP	6	0	
CY2V012FLXI (7C851003A)	4903174	610906623	ER	COMP	6	0	
CY2X012FLXC (7C851001A)	4903174	610906621	ER	COMP	6	0	
CY2VC511ZXC (7C851100A)	4803399	610820266/265/263	CML-RA	COMP	6	0	
CY2VC511ZXC (7C851001A)	4803399	610818852	ER	COMP	6	0	
CY2X014FLXCT (7C851002A)	4803399	610818855	ER	COMP	6	0	
CY2V012FLXCT (7C851003A)	4803399	610818854	ER	COMP	6	0	
CY2V013FLXIT (7C851004A)	4803399	610818851	ER	COMP	6	0	
CY2XP31ZXC (7C851010A)	4803399	610818851	ER	COMP	6	0	

STRESS: TC COND. C -65C TO 150C, PRE COND 192 HRS, 30C/60%RH, MSL3

CY2VC521ZXC (7C851101AC)	4803399	610820272/270/271	CML-RA	300	80	0	
CY2VC521ZXC (7C851101AC)	4803399	610820272/270/271	CML-RA	500	80	0	
CY2VC521ZXC (7C851101AC)	4803399	610820272/270/271	CML-RA	1000	80	0	
CY2VC521ZXC (7C851101AC)	4803399	610820272/270/271	CML-RA	1500	80	0	



Reliability Test Data

QTP #: 091601

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, 2200V							
CY2VC831ZXC (7C851012A)	4903174	610911034/5/6	CML-RA	COMP	8	0	
CY2XP91FZXC (7C851202A)	4903174	610911031/2/3	CML-RA	COMP	8	0	
STRESS: STATIC LATCH-UP TESTING (125C, $\pm 200mA$)							
CY2VC831ZXC (7C851012A)	4903174	610911034/5/6	CML-RA	COMP	6	0	
CY2XP91FZXC (7C851202A)	4903174	610911031/2/3	CML-RA	COMP	6	0	

Reliability Test Data

QTP #: 093101

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
STRESS: ESD-CHARGE DEVICE MODEL (500V)							
CY2XP31ZXC (7C851203A)	4903174	610920081	TAIWAN-T	COMP	9	0	
CY2XL11ZXC (7C851204A)	4903174	610919761	TAIWAN-T	COMP	9	0	
STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, 2200V							
CY2XP31ZXC (7C851203A)	4903174	610920081	TAIWAN-T	COMP	8	0	
CY2XL11ZXC (7C851204A)	4903174	610919761	TAIWAN-T	COMP	8	0	
STRESS: STATIC LATCH-UP TESTING (125C, ±200mA)							
CY2XP31ZXC (7C851203A)	4903174	610920081	TAIWAN-T	COMP	6	0	
CY2XL11ZXC (7C851204A)	4903174	610919761	TAIWAN-T	COMP	6	0	



Reliability Test Data

QTP #: 092803

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: E-TEST

CY2X012FLXI (7C85100A)	4917670	N/A	N/A	COMP	COMPARABLE		
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STRESS: SORT YIELD

CY2X012FLXI (7C85100A)	4917670	N/A	N/A	COMP	COMPARABLE		
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Reliability Test Data

QTP #: 120105

Device	Fab Lot #	Assy Lot #	Assy Loc	Duration	Samp	Rej	Failure Mechanism
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STRESS: ESD-CHARGE DEVICE MODEL (500V)

CY2XP61LQXI (7C851300A)	4119570	611205893	TAIWAN-G	COMP	9	0	
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STRESS: ESD-HUMAN BODY CIRCUIT PER JESD22, METHOD A114, 2200V

CY2XP61LQXI (7C851300A)	4119570	611205893	TAIWAN-G	COMP	8	0	
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STRESS: STATIC LATCH-UP TESTING (85C, ±140mA)

CY2XP61LQXI (7C851300A)	4119570	611205893	TAIWAN-G	COMP	6	0	
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Document History Page

Document Title: QTP # 064302 : XO LN FLEXO DEVICE FAMILY (LOW NOISE XO/VCXO/VCO CRYSTAL OSCILLATOR AND CLOCK GENERATOR), L8C-3R TECHNOLOGY, FAB 4

Document Number: 001-88013

Rev.	ECN No.	Orig. of Change	Description of Change
**	4033666	ILZ	Initial Spec Release Qualification report published on Cypress.com is documented on memo HGA-951 is not in spec format. Initiated spec for QTP 064302 and all data from Memo HGA-951 was transferred to qualification report spec template. Deleted package qualification details on package qualification history table. Deleted Cypress reference Spec and replaced with Industry Standards Updated package availability based on current qualified test & assembly site.
*A	4048909	NSR	Added CY2XP61 device and QTP#120105 data. Changed MID to MPD Added 24-Pin QFN package option and ASE-TAIWAN for its assembly site. Fixed page alignment, font format and data alignment. Added Document Number in the document history page.
*B	4151939	HSTO	Added device CY2X0147, CY2X0137 & CY2XF327 in the cover page and marketing part# in MMNH-91. Update Package Availability table
*C	4417735	JYF	Sunset Review: Updated QTP title page; Updated Reliability Tests Performed table: <ul style="list-style-type: none"> - Added industry standard of EFR/LFR,LLV,LTOL,HTSSL,HTS, HAST,PCT - Added preconditioning step in Acoustic Microscopy

Distribution: WEB

Posting: None