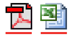
Product Change Notification - LIAL-10CXTM831

Date:
20 Dec 2018
Product Category:
Memory
Affected CPNs:

Notification subject:
Memo # ML122018001Q: Final Notice: Qualification of 36.3K process technology for selected Microchip products of the 24xx01, 24xx02, and 24xx04 device families.
Notification text:

PCN Status:
Final notification.

PCN Type:
Manufacturing Change

Microchip Parts Affected:
Please open one of the icons found in the Affected CPNs section above.

NOTE: For your convenience Microchip includes identical files in two formats (.pdf and .xls)

Description of Change:
Qualification of 36.3K process technology for selected Microchip products of the 24xx01, 24xx02, and 24xx04 device families.

Pre Change:
Available in 160K wafer technology fabricated at Microchip fabrication sites FAB2 and FAB4 (Tempe, AZ and Gresham, OR, USA) using 8 inch wafers

Post Change:
Available in 160K wafer technology fabricated at Microchip fabrication sites FAB2 and FAB4 (Tempe, AZ and Gresham, OR, USA) using 8 inch wafers or available in 36.3K wafer technology fabricated at FAB 5 (Colorado Springs, CO, USA) using 6 inch wafers.

Pre and Post Change Summary:

	Pre Change	Post Change	
Wafer Technology	160K wafer technology	160K wafer technology	36.3K wafer technology
Fabrication Location	Microchip Fabrication Sites FAB 2 and FAB4 (Tempe, AZ and Gresham, OR, USA)	Microchip Fabrication Sites FAB 2 and FAB4 (Tempe, AZ and Gresham, OR, USA)	FAB 5 (Colorado Springs, CO USA)
Wafer Diameter	8 inches (200 mm)	8 inches (200 mm)	6 inches (150 mm)
Quality certification	ISO/TS16949	ISO/TS16949	ISO9001/TS16949

Impacts to Data Sheet:
None

Change Impact:
None

Reason for Change:
To improve manufacturability by qualifying an additional fabrication site.

Change Implementation Status:
In Progress.

Estimated First Ship Date:
February 5, 2019 (date code: 1906)

NOTE: Please be advised that after the estimated first ship date customers may receive pre and post change parts.

Time Table Summary:

	December 2018					->	February 2019				
Workweek	48	49	50	51	52		5	6	7	8	9
Final PCN Issue Date				X							
Qual Report Availability				X							
Estimated Implementation Date							X				

Method to Identify Change:
Traceability code

Qualification Report:
Please open the attachments included with this PCN labeled as PCN_#_Qual Report.

Revision History:
December 20, 2018: Issued final notification. Attached the qualification report. Provided estimated first ship date to be on February 5, 2019.
The change described in this PCN does not alter Microchip's current regulatory compliance regarding the material content of the applicable products.

Attachment(s):
PCN_LIAL-10CXTM831_QUAL_REPORT.pdf

Please contact your local Microchip sales office with questions or concerns regarding this notification.

Terms and Conditions:

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If you wish to change your PCN profile, including opt out, please go to the PCN home page select login and sign into your myMicrochip account. Select a profile option from the left navigation bar and make the applicable selections.

Affected Catalog Part Numbers (CPN)

24AA01/SN
24AA01H-I/MS
24AA01H-I/P
24AA01H-I/SN
24AA01H-I/ST
24AA01HT-I/LT
24AA01HT-I/MNY
24AA01HT-I/MS
24AA01HT-I/OT
24AA01HT-I/SN
24AA01HT-I/ST
24AA01-I/MS
24AA01-I/P
24AA01-I/SN
24AA01-I/ST
24AA01T/SN
24AA01T-I/LT
24AA01T-I/MC
24AA01T-I/MNY
24AA01T-I/MS
24AA01T-I/OT
24AA01T-I/SN
24AA01T-I/ST
24AA02/P
24AA02/SN
24AA02/ST
24AA02H-I/MS
24AA02H-I/P
24AA02H-I/SN
24AA02H-I/ST
24AA02HT-I/LT
24AA02HT-I/MNY
24AA02HT-I/MS
24AA02HT-I/OT
24AA02HT-I/SN
24AA02HT-I/ST
24AA02-I/MS
24AA02-I/P
24AA02-I/SN
24AA02-I/ST
24AA02T/SN
24AA02T-I/LT
24AA02T-I/MC
24AA02T-I/MNY
24AA02T-I/MS
24AA02T-I/OT

24AA02T-I/SN
24AA02T-I/ST
24LC01B/P
24LC01B/SN
24LC01B/ST
24LC01BH-I/MS
24LC01BH-I/P
24LC01BH-I/SN
24LC01BH-I/ST
24LC01BHT-I/LT
24LC01BHT-I/MNY
24LC01BHT-I/MS
24LC01BHT-I/OT
24LC01BHT-I/SN
24LC01BHT-I/ST
24LC01B-I/MS
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24LC02BHT-I/SN
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24LC02BT-I/MC
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24LC02BT-I/MS
24LC02BT-I/OT
24LC02BT-I/SN
24LC02BT-I/ST
24AA04/P
24AA04/SN
24AA04H-I/MS
24AA04H-I/P
24AA04H-I/SN
24AA04H-I/ST
24AA04HT-I/MNY
24AA04HT-I/MS
24AA04HT-I/OT
24AA04HT-I/SN
24AA04HT-I/ST
24AA04-I/MC
24AA04-I/MS
24AA04-I/P
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24AA04-I/ST
24AA04T/SN
24AA04T-I/MC
24AA04T-I/MNY
24AA04T-I/MS
24AA04T-I/OT
24AA04T-I/SN
24AA04T-I/ST
24LC04B/P
24LC04B/SN
24LC04B/ST
24LC04BH-I/MS
24LC04BH-I/P
24LC04BH-I/SN
24LC04BH-I/ST
24LC04BHT-I/MNY
24LC04BHT-I/MS
24LC04BHT-I/OT
24LC04BHT-I/SN
24LC04BHT-I/ST
24LC04B-I/MC
24LC04B-I/MS
24LC04B-I/P
24LC04B-I/SN
24LC04B-I/ST
24LC04BT/SN
24LC04BT/ST
24LC04BT-I/MC

24LC04BT-I/MNY

24LC04BT-I/MS

24LC04BT-I/OT

24LC04BT-I/SN

24LC04BT-I/ST

QUALIFICATION REPORT SUMMARY

RELIABILITY LABORATORY

PCN#: LIAL-10CXTM831

Date
November 27, 2018

Qualification of 36.3K process technology for selected Microchip products of the 24xx01, 24xx02, and 24xx04 device families

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SUMMARY QUALIFICATION REPORT

Purpose:	Qualification of 36.3K process technology for selected Microchip products of the 24xx01, 24xx02, and 24xx04 device families.
Document Control #:	ML112018006E
Document Revision:	D
Device(s):	24xx01x, 24xx02x, 24xx04x
Product:	4K, 512 X 8 1.8V SERIAL EE
Mask Identification #:	363V2
Process	36.3K
MSL:	3301

Test Conditions:

TEST	METHOD	CONDITION	SAMPLE SIZE RUN	CRITERIA
Early Life Failure Test	AEC Q100	150 °C, 24 Hrs Electrical Test at +25 °C and 125 °C	820	0/800
High Temperature Operating Life / Dynamic Life Test	MIL-STD 883 Method 1005	150°C, 408 Hrs Electrical Test at -40°C, +25°C, +85°C and/or +125°C.	620	0/600 1 Lot
Endurance Cycling and Bakes (END)	MIL-STD 883 Method 1033	100K data memory, E/W cycles, 85°C Bake 1: 150°C, 48 Hrs Bake 2: 150°C, 48 Hrs	242	0/231
High Temperature Retention Bake (RET)	MIL-STD 883 Method 1033	175°C, 504 Hrs	242	0/231
EDR HTOL(DLT)	MIL-STD 883 Method 1033	100K data memory, E/W cycles, 85 °C, 408 hours HTOL at 150 °C Electrical pre and post test at +25 °C and 125 °C.	92	0/77
ESD Human Body Model	JS-001	1.5K Ohm, 100 pF Electrical Test at +25°C, +85°C and/or +125°C.	27	2000 V 1 Lot
ESD Charged Device Model	JS-002	1 Ohm pogo pin to ground with a 50-ohm impedance matched cable, device is placed onto a charge plate separated by a dielectric material. Electrical test at +25°C, +85°C and/or +125°C.	18	500V on all pins, 750V on corner pins 1 Lot
ESD Machine Model	JESD22A115	0 Ohm, 200 pF Electrical Test at +25°C, +85°C and/or +125°C.	12	200 V 1 Lot
Latch-up Testing	JESD78	Trigger Voltage Limit = 1.5*V_{max} Pulse Width = 10 ms Rise/Fall Time = 500 us Test at +25°C and +125°C	6 24	1 Lot 200 mA (0/6) 105 mA (0/12)

SUMMARY QUALIFICATION REPORT

Qualification Material:

LOT	LOT 1	LOT 2	LOT 3
DEVICE	24LC04B	24LC04B	24LC04B
MASK, REV	363V2, C0	363V2, C1	363V2, C1
WAFER FAB	Colorado Springs 6 inch fabrication	Colorado Springs 6 inch fabrication	Colorado Springs 6 inch fabrication
WAFER PROCESS	36.3K 6''	36.3K 6''	36.3K 6''
WAFER LOT	MCSO519113359.000	E8U3576	MCSO519228073.000
ASSEMBLY LOT	MMT-191401703.000	Chandler	MMT-192801215.000
PACKAGE	PDIP	8L GSB	8L TSSOP
ASSEMBLY SITE	MMT	Chandler	MMT
FINAL TEST	MTAI	Chandler	MCSO
QUAL #	R18097-0x	ML092018001L ML092018006A	ML122018002C/ ML1220180048
CN #	ES212662	ES212662	ES212662
QUAL TESTS	ELFR, HTOL	ESD HBM, MM, LU	CDM, LU

Conclusion: ☒ Pass ☐ Fail ☐

Based on the results, the 24LC04B complies with the reliability guidelines specified in QCI-39000. Therefore, the 24xx04x, 24xx02x, and the 24xx01x are released to production

Die Level Results:

DYNAMIC LIFE TESTING AT 150°C

	24 Hours	408 Hours
Lot 1	0/820	0/620

Activation Energy	0.7 eV
Derated Temperature	55°C

	Infant Mortality	Total Life	MTBF (Years)
Device Hours	19,680	257,760	N/A
Fit Rate - 50% Confidence	136	10	10997.80
Fit Rate - 60% Confidence	180	14	8317.59
Fit Rate - 90% Confidence	452	34	3310.66

Note: One FIT is one fail in 109 device hours

	Best Estimated Failure Rate (%\KHR)
Infant Mortality	0.0136
Total Life	0.0010

ENDURANCE CYCLING AT 85°C AND BAKES AT 150°C

	100,000 cycles Data Flash Memory Erase/Write Cycling	Bake 1	Bake 2
Lot 1	0/242	0/242	0/242

HIGH TEMPERATURE RETENTION BAKE AT 175°C

	96 Hours	504 Hours
Lot 1	0/242	0/242

Activation Energy	0.7 eV
Derated Temperature	55°C

	Total Life
Device Hours	116,160
FIT Rate - 50% Confidence	23
FIT Rate - 60% Confidence	30
FIT Rate - 90% Confidence	76

Note: One FIT is one fail in 10^9 device hours

ENDURANCE CYCLING AT 85ºC AND DYNAMIC LIFE TEST AT 150ºC (HTOL)

	100,000 cycles Data Flash Memory Erase/Write Cycling	96 Hours (HTOL)	408 Hours (HTOL)
Lot 1	0/92	0/92	3/89[a]

[*] Three devices were discounted due to test handler damage to the leads

ELECTROSTATIC DISCHARGE TESTS

	Human Body Model	Machine Model
Lot 2	Pass up to 5500V	Pass up to 400V

	Charge Device model
Lot 3	Pass up to 2000V

LATCH-UP TEST

	200mA @ 25C	105mA @ 85ºC
Lot 2	Passed	Passed

	105mA @ 125C
Lot 3	Passed