



Date Created: 2/5/2004

Date Issued: 3/2/2004

PCN # 20040603

DESIGN/PROCESS CHANGE NOTIFICATION -- FINAL

Notification of this change was initially distributed via Forecast Change Notice #20031701, issued 5/20/2003. This PCN covers the SC70 packaged products identified in the FCN. Additional PCNs are being issued for the other products listed in the FCN.

This is to inform you that a design and/or process change will be made to the following product(s). This notification is for your information and concurrence.

If you require data or samples to qualify this change, please contact **Fairchild Semiconductor within 30 days of receipt of this notification.**

If you have any questions concerning this change, please contact:

Name: Ray, Kenneth
E-Mail: Kenneth.Ray@notes.fairchildsemi.com
Phone: 1-207-775-8210

PCN Originator

Name: Ray, Kenneth
E-mail: Kenneth.Ray@notes.fairchildsemi.com
Phone: 1-207-775-8210

REL Engineer

Name: Travis, Rob
E-mail: Rob.Travis@notes.fairchildsemi.com
Phone: 1-207-761-3259

PCN Type: Alternate Fab Location

Effectivity

Expected 1st Device Shipment Date: 4/2/2004
Earliest Year/Work Week of Changed Product: 0414
(Note: Package marking may differ from this format)

Product ID (Description):

This notification affects the TinyLogic, 5-lead and 6-lead, SC70 packaged, ULP and ULP-A products assembled at Fairchild's assembly subcontractor Hana Semiconductor, Thailand. Please see the attached product list for specific products.

Description of Change:

Fairchild is announcing the qualification of its South Portland, Maine, FS35 Fab Process to produce 0.35 um products. Prior to this qualification, Fairchild's 035 um products were fabricated at TSMC, Taiwan.

Fairchild's 0.35 um fabrication process is equivalent to the TSMC's 0.35 um process. Material produced in South Portland is interchangeable with material produced at TSMC. Fairchild product will now be fabricated at both sites. There will be no package top mark or other distinguishing feature denoting which fabrication facility the material came from.

Effect of Change:

All package dimensions, product performance, and production test specifications will remain unchanged. Material fabricated in the South Portland facility meets the same quality and reliability standards as TSMC fabricated material.

Qualification:

Full Rel Qualification data on the Fairchild FS35 fab process has been completed. All reliability stresses outlined in the reliability qualification plan were successfully met.

Qual/REL Plan Numbers

Additional Qualification Data



**RELIABILITY
TEST REPORT**

F20030061A

Title:

To Qualify the FS35 Fab Process in the 5-lead SC70 package Assembled at Hana.

Abstract:

To Qualify the FS35 Fab Process with the 5-lead SC70 package assembled at Hana's Bangkok Thailand facility.

Reference File Numbers

Q20030061A

Distribution List

| | |
|---------------|---------------|
| Rob Travis | Jean Gordon |
| Dennis Twomey | Robert Murphy |
| Rolf Dries | Ken Ray |

Description

| Lot | Device Name | Fab | Fab Lot Number | Assembly | Assembly Lot Number | Description |
|-------------|-------------|-----|----------------|----------|------------------------------|--------------|
| Q20030061AA | NC7SV125P5X | ME | M010217445 | Hana | PMP010337771 D/C: B0332AB | FS35C / SC70 |
| Q20030061AB | NC7SV125P5X | ME | M010217445 | Hana | PMP010337773 D/C: B0332AB | FS35C / SC70 |

Approvals

| | |
|--|---------------|
| Test Report Author: Robert Travis | Date: 1/21/04 |
| Qualification Plan Author: Robert Travis | Date: 1/21/04 |
| Reliability Manager: Dennis Twomey | Date: 1/21/04 |

Tests Performed

| Test: MSL(1), PKG(Small), Peak Temp (235c), Cycles(3) (Precondition) | | | | | |
|--|-------------|-------------------|-----------------|---------------|--|
| Lot | Device | Industry Standard | Test Conditions | Read Points | |
| Q20030061AAPC1AA | NC7SV125P5X | JESD22-A113 | | | |
| Q20030061ABPC1AA | NC7SV125P5X | JESD22-A113 | | | |
| Test: (Autoclave) | | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points | |
| Q20030061AAACLVA | NC7SV125P5X | JESD22-A102 | 121C, 100%RH | 96 hrs | |
| Q20030061ABACLVA | NC7SV125P5X | JESD22-A102 | 121C, 100%RH | 96 hrs | |
| Test: (High Temperature Storage Life) | | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points | |
| Q20030061AAHTSLA | NC7SV125P5X | JESD22-A103 | 150C | 168, 1000 hrs | |

| | | | | |
|---|---------------|--------------------------|------------------------|--------------------|
| Q20030061ABHTSLA | NC7SV125P5X | JESD22-A103 | 150C | 168, 1000 hrs |
| Test: (Highly Accelerated Stress Test) | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points |
| Q20030061AAHAST1A | NC7SV125P5X | JESD22-A110 | 130C, 85%RH | 96 hrs |
| Q20030061ABHAST1A | NC7SV125P5X | JESD22-A110 | 130C, 85%RH | 96 hrs |
| Test: (Static Op Life) | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points |
| Q20030061AASOPL1A | NC7SV125P5X | JESD22-A108 | 150C | 168, 1000 hrs |
| Q20030061ABSOPL1A | NC7SV125P5X | JESD22-A108 | 150C | 168, 1000 hrs |
| Test: (Temperature Cycle) | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points |
| Q20030061AATMCL1A | NC7SV125P5X | JESD22-A104 | -65C, 150C | 500, Cycles |
| Q20030061ABTMCL1A | NC7SV125P5X | JESD22-A104 | -65C, 150C | 500, Cycles |
| Test: (Gate Leakage) | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points |
| Q20030061AAGATEA | NC7SV125P5X | AEC-Q100-006 | 155C, +/-400V | |
| Q20030061ABGATEA | NC7SV125P5X | AEC-Q100-006 | 155C, +/-400V | |

Mechanical Tests:

| | | | | |
|---|---------------|--------------------------|------------------------|--------------------|
| Test: (Bond Pull) | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points |
| Q20030061AABPULLA | NC7SV125P5X | JESD22-C100 | | |
| Q20030061ABBPULLA | NC7SV125P5X | JESD22-C100 | | |
| Test: (Bond Shear) | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points |
| Q20030061AABSHRA | NC7SV125P5X | AEC-Q100-001 | | |
| Q20030061ABBSHRA | NC7SV125P5X | AEC-Q100-001 | | |
| Test: (Die Shear) | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points |
| Q20030061AADSHRA | NC7SV125P5X | MIL-STD-883-2019 | | |
| Q20030061ABDSHRA | NC7SV125P5X | MIL-STD-883-2019 | | |
| Test: As Received; Die Surface, Die Attach, Leadframe Front, Leadframe Back (C Scanning Acoustical Microscope) | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points |
| Q20030061AACSAM1A | NC7SV125P5X | | | |
| Q20030061ABCSAM1A | NC7SV125P5X | | | |
| Test: Post Precondition; Die surface, Die Attach, Leadframe Front, Leadframe Back (C Scanning Acoustical Microscope) | | | | |
| Lot | Device | Industry Standard | Test Conditions | Read Points |
| Q20030061AACSAM2A | NC7SV125P5X | | | |
| Q20030061ABCSAM2A | NC7SV125P5X | | | |

Environmental Results:

| | | | | |
|--|---------------|-----------------------|--|---------------------|
| Test: MSL (1), PKG(Small), Peak Temp (235c), Cycles(3) (Precondition) | | | | |
| Lot | Device | Precon Results | | Failure Code |
| Q20030061AAPC1AA | NC7SV125P5X | 0/340 | | - |
| Q20030061ABPC1AA | NC7SV125P5X | 0/340 | | - |

| | | | | |
|--------------------------|---------------|-------------------------|--|---------------------|
| Test: (Autoclave) | | | | |
| Lot | Device | 96-HOURS Results | | Failure Code |
| Q20030061AAACLVA | NC7SV125P5X | 0 / 77 | | - |

| | | | | |
|---|---------------|---------------------------|---------------------------|---------------------|
| Q20030061ABACLVA | NC7SV125P5X | 0 / 77 | | - |
| Test: (High Temperature Storage Life) | | | | |
| Lot | Device | 168-HOURS Results | 1000-HOURS Results | Failure Code |
| Q20030061AAHTSLA | NC7SV125P5X | 0 / 77 | 0 / 77 | - |
| Q20030061ABHTSLA | NC7SV125P5X | 0 / 77 | 0 / 77 | - |
| Test: (Highly Accelerated Stress Test) | | | | |
| Lot | Device | 96-HOURS Results | | Failure Code |
| Q20030061AAHAST1A | NC7SV125P5X | 0 / 45 | | - |
| Q20030061ABHAST1A | NC7SV125P5X | 0 / 45 | | - |
| Test: (Static Op Life) | | | | |
| Lot | Device | 168-HOURS Results | 1000-HOURS Results | Failure Code |
| Q20030061AASOPL1A | NC7SV125P5X | 0 / 77 | 0 / 77 | - |
| Q20030061ABSOP1A | NC7SV125P5X | 0 / 77 | 0 / 77 | - |
| Test: (Temperature Cycle) | | | | |
| Lot | Device | 500-CYCLES Results | | Failure Code |
| Q20030061AATMCL1A | NC7SV125P5X | 0 / 77 | | - |
| Q20030061ABTMCL1A | NC7SV125P5X | 0 / 77 | | - |
| Test: (Gate Leakage): + 400 Volts | | | | |
| Lot | Device | | | Failure Code |
| Q20030061AAGATEA | NC7SV125P5X | 0 / 3 | | - |
| Q20030061ABGATEA | NC7SV125P5X | 0 / 3 | | - |
| Test: (Gate Leakage): - 400 Volts | | | | |
| Lot | Device | | | Failure Code |
| Q20030061AAGATEA | NC7SV125P5X | 0 / 3 | | - |
| Q20030061ABGATEA | NC7SV125P5X | 0 / 3 | | - |

Mechanical Results:

| | | | | |
|---|---------------|--------|--|---------------------|
| Test: (Bond Pull) | | | | |
| Lot | Device | | | Failure Code |
| Q20030061AABPULLA | NC7SV125P5X | 0 / 45 | | - |
| Q20030061ABBPULLA | NC7SV125P5X | 0 / 45 | | - |
| Test: (Bond Shear) | | | | |
| Lot | Device | | | Failure Code |
| Q20030061AABSHRA | NC7SV125P5X | 0 / 45 | | - |
| Q20030061ABBSHRA | NC7SV125P5X | 0 / 45 | | - |
| Test: (Die Shear) | | | | |
| Lot | Device | | | Failure Code |
| Q20030061AADSHRA | NC7SV125P5X | 0 / 5 | | - |
| Q20030061ABDSHRA | NC7SV125P5X | 0 / 5 | | - |
| Test: As Received; Die Surface, Die Attach, Lead-frame Front, Lead-frame Back (C Scanning Acoustical Microscope) | | | | |
| Lot | Device | | | Failure Code |
| Q20030061AACSAM1A | NC7SV125P5X | 0 / 10 | | - |
| Q20030061ABCSAM1A | NC7SV125P5X | 0 / 10 | | - |
| Test: Post Precondition; Die surface, Die Attach, Lead-frame Front, Lead-frame Back (C Scanning Acoustical Microscope) | | | | |
| Lot | Device | | | Failure Code |

| | | | |
|--|-------------|--------|---|
| Q20030061AACSAM2A | NC7SV125P5X | 0 / 10 | - |
| Q20030061ABCSAM2A | NC7SV125P5X | 0 / 10 | - |
| In accordance with JEDEC Standard J-STD-20B the impact of de-lamination was evaluated with passing results based on the performance of the other stress tests outlined in this reliability report, as a result this part is determined to be MSL-1 @ 235°C | | | |

Conclusion

All reliability stresses outlined in the reliability qualification plan Q20030061 were successfully met, and unconditionally qualify for production the FS35C core CMOS process for assembly in the Hana assembled SC-70 package.

Affected FSIDs

| | | |
|-------------|-------------|-------------|
| NC7SP00P5X | NC7SP02P5X | NC7SP04P5X |
| NC7SP05P5X | NC7SP08P5X | NC7SP125P5X |
| NC7SP126P5X | NC7SP14P5X | NC7SP157P6X |
| NC7SP158P6X | NC7SP17P5X | NC7SP19P6X |
| NC7SP32P5X | NC7SP34P5X | NC7SP38P5X |
| NC7SP57P6X | NC7SP58P6X | NC7SP86P5X |
| NC7SPU04P5X | NC7SV00P5X | NC7SV02P5X |
| NC7SV04P5X | NC7SV05P5X | NC7SV08P5X |
| NC7SV11P6X | NC7SV125P5X | NC7SV126P5X |
| NC7SV14P5X | NC7SV157P6X | NC7SV158P6X |
| NC7SV17P5X | NC7SV19P6X | NC7SV32P5X |
| NC7SV34P5X | NC7SV38P5X | NC7SV57P6X |
| NC7SV58P6X | NC7SV86P5X | NC7SVU04P5X |
| NC7WP14P6X | NC7WV04P6X | NC7WV07P6X |
| NC7WV14P6X | NC7WV16P6X | NC7WV17P6X |