



Date Created: 4/5/2004
Date Issued: 4/18/2004
PCN # 20040202-A

DESIGN/PROCESS CHANGE NOTIFICATION -- FINAL

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:

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PCN Originator

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REL Engineer

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PCN Type: Alternate Assembly/Test Location/Qualification

Effectivity

Expected 1st Device Shipment Date: 4/25/2004
Earliest Year/Work Week of Changed Product: 0418
(Note: Package marking may differ from this format)

Product ID (Description):

Description of Change:

Fairchild Semiconductor initial offerings in this package were manufactured at Amkor Technologies (Phillipines) which is a Fairchild qualified sub-contractor. This change is to allow manufacturing of TSSOP28L at the Fairchild Semiconductor Penang assembly facility. The intent is to ultimately offer Fairchild TSSOP28L products manufactured at both the Fairchild Semiconductor Penang site and Amkor Technologies (Phillipines) and to ship the units from all locations interchangeably to better serve our customers.

The FSPMbill of material (BOM) will be as follows:

Leadframe base: Copper C194
Internal lead plating: SPot silver
Die-Attach paste: Hitachi Poly 6, conductive, silver filled
Gold wire: 99.99%
Mold compound: Shinetsu KMC289-7
Lead finish: Post plated, Pb(15%)/Sn(85%)

Effect of Change:

There is no change to the physical dimensions of the package. Both the assembly locations are assembling to exactly the same marketing outline. There will be no change to the quality or reliability of this package.

Qualification:

The qualification vehicle shall be 3 lots of FAN5019MTC processed with 3 different batches of materials.

Reliability stress testing will be performed to qualify the Fairchild Penang plant as outlined in the qualification plan attached. Final PCN will be issued upon completion of full reliability testing.

Qual/REL Plan Numbers

Additional Qualification Data



Reliability Test Report

File Number:
FEP20040018
Originator:
Eng Teik Poh
Date: March 30, 2004

Purpose

To qualify the TSSOP 28 leads products insourcing in FSPM.

Approvals

MT Poh

Reliability Engineer

Date

TH Lee

Mgr. Rel. Engineering

Date

Reference File Numbers

REP200400023
Q20030165

Distribution List

Abstract

TSSOP 28 Leads Insourcing in FSPM. Currently these products are assembled in Amkor Philippines.

Description

| Test Request | Device Name | Sbgrp | Wafer Die Run | Fab Loc | Fab Line | Pkg Code | # Leads | Assy Loc | Date Cd | Mold Cmpnd |
|--------------|-------------|-------|---------------|------------|----------|----------|---------|-------------|---------|------------|
| REP200400023 | FAN5019MTC | A | MG00246189 | FM | | N\MTC0 | 28 | EP | 0348 | |

| | | | | | | | | |
|--------------|------------|---|------------|----|-------|----|----|------|
| REP200400023 | FAN5019MTC | B | MG00246189 | FM | NMTC0 | 28 | EP | 0348 |
| REP200400023 | FAN5019MTC | C | MG00246189 | FM | NMTC0 | 28 | EP | 0348 |

Tests Performed

| | | | | | | | | |
|---|--------------|-------|--------------|----------|-----------|---------|--|--|
| Test: Autoclave Test (ACLV) | | | | | | | | |
| Test Request | Device | Sbgrp | Rel Humidity | Pressure | High Temp | LowTemp | | |
| REP200400023 | FAN5019MTC | A | 100 | 15 | 121 | | | |
| REP200400023 | FAN5019MTC | B | 100 | 15 | 121 | | | |
| REP200400023 | FAN5019MTC | C | 100 | 15 | 121 | | | |
| Timepoints: | Test Request | TP | Duration | | | | | |
| | REP200400023 | 1 | 96 | | | | | |
| | REP200400023 | 2 | 336 | | | | | |
| Test: High Temperature Storage test (bake) (HTSL) | | | | | | | | |
| Test Request | Device | Sbgrp | Rel Humidity | Pressure | High Temp | LowTemp | | |
| REP200400023 | FAN5019MTC | A | | | 150 | | | |
| REP200400023 | FAN5019MTC | B | | | 150 | | | |
| REP200400023 | FAN5019MTC | C | | | 150 | | | |
| Timepoints: | Test Request | TP | Duration | | | | | |
| | REP200400023 | 1 | 168 | | | | | |
| | REP200400023 | 2 | 1000 | | | | | |
| Test: Operating Life Test (Static) (SOPL) | | | | | | | | |
| Test Request | Device | Sbgrp | Rel Humidity | Pressure | High Temp | LowTemp | | |
| REP200400023 | FAN5019MTC | A | | | 150 | | | |
| REP200400023 | FAN5019MTC | B | | | 150 | | | |
| REP200400023 | FAN5019MTC | C | | | 150 | | | |
| Timepoints: | Test Request | TP | Duration | | | | | |
| | REP200400023 | 1 | 168 | | | | | |
| | REP200400023 | 2 | 1000 | | | | | |
| Test: Temperature Cycle (TMCL) | | | | | | | | |
| Test Request | Device | Sbgrp | Rel Humidity | Pressure | High Temp | LowTemp | | |
| REP200400023 | FAN5019MTC | A | | | 150 | -65 | | |
| REP200400023 | FAN5019MTC | B | | | 150 | -65 | | |
| REP200400023 | FAN5019MTC | C | | | 150 | -65 | | |
| Timepoints: | Test Request | TP | Duration | | | | | |
| | REP200400023 | 1 | 500 | | | | | |
| | REP200400023 | 2 | 1000 | | | | | |
| Test: Temperature Humidity Bias Test (THBT) | | | | | | | | |
| Test Request | Device | Sbgrp | Rel Humidity | Pressure | High Temp | LowTemp | | |
| REP200400023 | FAN5019MTC | A | 85 | | 85 | | | |
| REP200400023 | FAN5019MTC | B | 85 | | 85 | | | |
| REP200400023 | FAN5019MTC | C | 85 | | 85 | | | |
| Timepoints: | Test Request | TP | Duration | | | | | |
| | REP200400023 | 1 | 168 | | | | | |
| | REP200400023 | 2 | 1000 | | | | | |

Results/Discussion

| | | | | | | | |
|---|------------|-------|----|----------|-------------|---------|--|
| Test: Autoclave Test (ACLV) Preconditioning at 260C level 2 | | | | | | | |
| Test Request | Device | Sbgrp | TP | Duration | Sample Size | Rejects | |
| REP200400023 | FAN5019MTC | A | 1 | 96 | 80 | 0 | |
| REP200400023 | FAN5019MTC | A | 2 | 336 | 80 | 0 | |
| REP200400023 | FAN5019MTC | B | 1 | 96 | 80 | 0 | |
| REP200400023 | FAN5019MTC | B | 2 | 336 | 80 | 0 | |

| | | | | | | |
|--------------|------------|---|---|-----|----|---|
| REP200400023 | FAN5019MTC | C | 1 | 96 | 80 | 0 |
| REP200400023 | FAN5019MTC | C | 2 | 336 | 80 | 0 |

Test: High Temperature Storage test (bake) (HTSL)

| Test Request | Device | Sbgrp | TP | Duration | Sample Size | Rejects |
|--------------|------------|-------|----|----------|-------------|---------|
| REP200400023 | FAN5019MTC | A | 1 | 168 | 80 | 0 |
| REP200400023 | FAN5019MTC | A | 2 | 1000 | 80 | 0 |
| REP200400023 | FAN5019MTC | B | 1 | 168 | 80 | 0 |
| REP200400023 | FAN5019MTC | B | 2 | 1000 | 80 | 0 |
| REP200400023 | FAN5019MTC | C | 1 | 168 | 80 | 0 |
| REP200400023 | FAN5019MTC | C | 2 | 1000 | 80 | 0 |

Test: Operating Life Test (Static) (SOPL) Preconditioning at 260C Level 2

| Test Request | Device | Sbgrp | TP | Duration | Sample Size | Rejects |
|--------------|------------|-------|----|----------|-------------|---------|
| REP200400023 | FAN5019MTC | A | 1 | 168 | 80 | 0 |
| REP200400023 | FAN5019MTC | A | 2 | 1000 | 80 | 0 |
| REP200400023 | FAN5019MTC | B | 1 | 168 | 80 | 0 |
| REP200400023 | FAN5019MTC | B | 2 | 1000 | 80 | 0 |
| REP200400023 | FAN5019MTC | C | 1 | 168 | 80 | 0 |
| REP200400023 | FAN5019MTC | C | 2 | 1000 | 80 | 0 |

Test: Temperature Humidity Bias Test (THBT) Preconditioning at 260C Level 2

| Test Request | Device | Sbgrp | TP | Duration | Sample Size | Rejects |
|--------------|------------|-------|----|----------|-------------|---------|
| REP200400023 | FAN5019MTC | A | 1 | 168 | 80 | 0 |
| REP200400023 | FAN5019MTC | A | 2 | 1000 | 80 | 0 |
| REP200400023 | FAN5019MTC | B | 1 | 168 | 80 | 0 |
| REP200400023 | FAN5019MTC | B | 2 | 1000 | 80 | 0 |
| REP200400023 | FAN5019MTC | C | 1 | 168 | 80 | 0 |
| REP200400023 | FAN5019MTC | C | 2 | 1000 | 80 | 0 |

Test: Temperature Cycle (TMCL) Preconditioning at 260C Level 2

| Test Request | Device | Sbgrp | TP | Duration | Sample Size | Rejects |
|--------------|------------|-------|----|----------|-------------|---------|
| REP200400023 | FAN5019MTC | A | 1 | 500 | 80 | 0 |
| REP200400023 | FAN5019MTC | A | 2 | 1000 | 80 | 0 |
| REP200400023 | FAN5019MTC | B | 1 | 500 | 80 | 0 |
| REP200400023 | FAN5019MTC | B | 2 | 1000 | 80 | 0 |
| REP200400023 | FAN5019MTC | C | 1 | 500 | 80 | 0 |
| REP200400023 | FAN5019MTC | C | 2 | 1000 | 80 | 0 |

Pull Test: spec limit 2.6 gf

| Test Request | Device | Sbgrp | Max | Min | Mean | Std Dev |
|--------------|------------|-------|------|-----|------|---------|
| REP200400023 | FAN5019MTC | A | 10.3 | 7.0 | 8.7 | 1.1 |

| | | | | | | |
|--|------------|-------|--------------|------------|---------------|---------|
| REP200400023 | FAN5019MTC | B | 10.9 | 8.1 | 9.6 | 0.7 |
| REP200400023 | FAN5019MTC | C | 10.7 | 8.3 | 9.4 | 0.6 |
| Ball Shear: spec limit 14.0 gf | | | | | | |
| Test Request | Device | Sbgrp | Max | Min | Mean | Std Dev |
| REP200400023 | FAN5019MTC | A | 36.7 | 26.5 | 32.2 | 2.7 |
| REP200400023 | FAN5019MTC | B | 39.9 | 28.1 | 34.9 | 3.3 |
| REP200400023 | FAN5019MTC | C | 39.7 | 26.3 | 33.0 | 3.3 |
| Die Shear: spec limit 0.4 kg | | | | | | |
| Test Request | Device | Sbgrp | Max | Min | Mean | Std Dev |
| REP200400023 | FAN5019MTC | A | 0.6 | 0.5 | 0.5 | 0.03 |
| REP200400023 | FAN5019MTC | B | 0.6 | 0.5 | 0.5 | 0.05 |
| REP200400023 | FAN5019MTC | C | 0.6 | 0.5 | 0.5 | 0.05 |
| Mold Voids, Wire Sweep, Solderability: | | | | | | |
| Test Request | Device | Sbgrp | Mold Voids | Wire Sweep | Solderability | |
| REP200400023 | FAN5019MTC | A | 0/224 | | 0/224 | 0/11 |
| REP200400023 | FAN5019MTC | B | 0/224 | | 0/224 | 0/11 |
| REP200400023 | FAN5019MTC | C | 0/224 | | 0/224 | 0/11 |
| Lead Fatigue, Resistant to Solder Heat (RSDH), Physical Dimension (PD), Solderability: | | | | | | |
| Test Request | Device | Sbgrp | Lead Fatigue | RSDH | PD | |
| REP200400023 | FAN5019MTC | A | 0/5 | | 0/5 | 0/5 |
| REP200400023 | FAN5019MTC | B | 0/5 | | 0/5 | 0/5 |
| REP200400023 | FAN5019MTC | C | 0/5 | | 0/5 | 0/5 |
| MSL Result: | | | | | | |
| In accordance with JEDEC standard J-STD-20 the impact of the delamination was evaluated with passing results based on the performance of the other reliability tests outlined in this reliability report, therefore the part is determined to be MSL level 2 at 260 deg C. | | | | | | |

Conclusion

All the reliability tests completed with no failure. Therefore FSPM is qualified to assemble TSSOP 28 leads products.

Affected FSIDs

| | | |
|--------------|--------------|--------------|
| FAN5018MTC | FAN5018MTCX | FAN5019MTC |
| FAN5019MTCX | FAN5026MTC | FAN5026MTCX |
| FAN5092MTC | FAN5092MTCX | FAN5094MTC |
| FAN5094MTCX | FAN5095MTC | FAN5231MTC |
| FAN5236MTC | FAN5236MTCX | FAN5239MTC |
| FAN5240MTC | FAN5240MTCX | FAN5243MTC |
| FAN5244MTC | FAN53166MTCX | FAN53168MTCX |
| FAN53180MTCX | FAN53181MTCX | |