# PRODUCT / PROCESS CHANGE NOTIFICATION

## 1. PCN basic data

| | |
|---|---|
| **1.1 Company** | STMicroelectronics International N.V |
| **1.2 PCN No.** | ADG/21/12778 |
| **1.3 Title of PCN** | SPC58NH92x (FC92): Activation of Additional Diffusion Plant and Package Upgrade |
| **1.4 Product Category** | see list |
| **1.5 Issue date** | 2021-05-19 |

## 2. PCN Team

| | |
|---|---|
| **2.1 Contact supplier** | |
| **2.1.1 Name** | ROBERTSON HEATHER |
| **2.1.2 Phone** | +1 8475853058 |
| **2.1.3 Email** | heather.robertson@st.com |
| **2.2 Change responsibility** | |
| **2.2.1 Product Manager** | Luca RODESCHINI |
| **2.1.2 Marketing Manager** | Matteo MOIOLI |
| **2.1.3 Quality Manager** | Alberto MERVIC |

## 3. Change

| **3.1 Category** | **3.2 Type of change** | **3.3 Manufacturing Location** |
|---|---|---|
| Transfer | Line transfer for a full process or process brick (process step, control plan, recipes) from one site to another site: Wafer fabrication | Subcontractor Samsung receiving Plan<br>ST Kirkop Assembly Plant |

## 4. Description of change

| | **Old** | **New** |
|---|---|---|
| **4.1 Description** | ST Crolles France<br>PrePlated Lead-Frame<br>Ni/Pd/Au Terminal Finishing | ST Crolles France and Subcontractor Samsung<br>High Density NEAP (Non-Etched Adhesion Promoter) Lead-Frame<br>Sn Terminal Finishing |
| **4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?** | No Impact | |

## 5. Reason / motivation for change

| | |
|---|---|
| **5.1 Motivation** | Capacity Increase |
| **5.2 Customer Benefit** | CAPACITY INCREASE |

## 6. Marking of parts / traceability of change

| | |
|---|---|
| **6.1 Description** | Dedicated Finished Good Codes |

## 7. Timing / schedule

| | |
|---|---|
| **7.1 Date of qualification results** | 2022-03-31 |
| **7.2 Intended start of delivery** | 2022-04-01 |
| **7.3 Qualification sample available?** | Upon Request |

## 8. Qualification / Validation

| | | | |
|---|---|---|---|
| **8.1 Description** | | | |
| **8.2 Qualification report and qualification results** | In progress | **Issue Date** | |

| 9. Attachments (additional documentations) |
|---|
| 12778 Public product.pdf<br>12778 Details.pdf |

| 10. Affected parts | | |
|---|---|---|
| 10. 1 Current | | 10.2 New (if applicable) |
| 10.1.1 Customer Part No | 10.1.2 Supplier Part No | 10.1.2 Supplier Part No |
| | SPC58NH92C5RMI0X | |

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# PRODUCT/PROCESS CHANGE NOTIFICATION

**TITLE**

**SPC58NH92x (FC92): Activation of Additional Diffusion Plant and Package Upgrade**

**IMPACTED PRODUCTS**

Below ST part number belonging to silicon line FC92:

| | | |
|---|---|---|
| SPC58NH92C5RTC0X | SPC58NH92E7RMI0Y | SPC58NH92C5RMI0Y |
| SPC58NH92C3RMI0X | SPC58NH92C5RMI0X | SPC58NH92C3HPC0Y |
| SPC58NH92C3RMI0Y | SPC58NH90C3RME0X | SPC58NH92C3RPE0X |
| SPC58NH90E7HTE0Y | SPC58NH92E7RMI0X | SPC58NH92C3HPC0X |

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**MANUFACT. STEP**

1- Silicon Diffusion
2- Assembly

**INVOLVED PLANT**

1- Subcontractor Samsung
2- ST Kirkop Malta

**CHANGE REASON**

Dual Sourcing Strategy and Service and Capacity Improvement

**CHANGE DESCRIPTION**

1- Activation of Subcontractor Samsung as additional silicon diffusion source.
2- Package upgrade through introduction of following changes:
  - Introduction of High Density NEAP (Non-Etched Adhesion Promoter) Lead-Frame
  - Leads finishing: from PPF (e4) to pure Sn (e3)

see below details and comparison

**TRACEABILITY**

Dedicated Finished Good codes

**VALIDATION**

According to ZVEI (AEC-Q100/Q006) recommendations, items
SEM-PW-13 - Move all or parts of production to a different wafer fab site
SEM-PA-04 - Change of lead frame finishing material / area (Internal)
SEM-PA-05 - Change of lead and heat slug plating material/plating thickness (external)
SEM-PA-14 Change in process technology (leadframe)

| AEC-Q100 Revision H | Temperature Humidity Bias or biased HAST | Autoclave or Unbiased HAST | Temperature Cycling | Power Temperature Cycling | High Temperature Operating Life | Early Life Failure Rate | NVM Endurance, Data Retention, and Operational Life | Wire Bond Shear | Wire Bond Pull | Electromigration | Time Depending Dielectric Breakdown | Hot Carrier Injection | Negative Bias Temperature Instability | Stress Migration | Electronic Discharge Human Body Model | Electronic Discharge Charged Device Model | Latch up | Electrical Distribution | Hermetic Package Test | Die Shear | Parameter-Analysis: Comparison of current with changed device characterization, electrical distribution | For Cu Wire Products: Consider AEC-Q006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | THB | AC | TC | PTC | HTOL | ELFR | EDR | WBS | WBP | EM | TDDB | HCI | NBTI | SM | HBM | CDM | LU | ED | MECH | DS |  |  |
|  | A2 | A3 | A4 | A5 | B1 | B2 | B3 | C1 | C2 | D1 | D2 | D3 | D4 | D5 | E2 | E3 | E4 | E5 | G1-4 | G7 |  |  |
| • | • | • | • | M | • | • | J | • | • | • | • | • | • | • | • | • | • | • | H | H | • | • |

|  |  |
|---|---|
| **REPORTS** | Transfer validation is presently in progress.<br>AEC-Q100 Reliability Report will be provided with complete set of qualification (including AEC-Q006 results) within March 2022 |
| **IMPLEMENTATION** | Change activation is proposed upon ST full qualification, pending Customer approval |

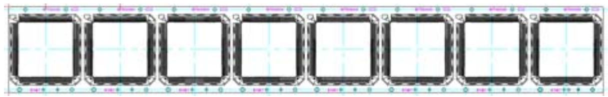
# QFP Advancement

## ST KIRKOP

## CURRENT QFP

| Package | | Lead Frame | Lead frame finish | PKG Terminal Finish |
|---|---|---|---|---|
| 20x20 | Exposed Pad | Layout \| 1 x 8 | Base Material Cu<br>Pre-plated NiPdAu | NiPdAu |
| 24x24 | Exposed Pad | Layout \| 1 x 8 | Base Material Cu<br>Pre-plated NiPdAu | NiPdAu |

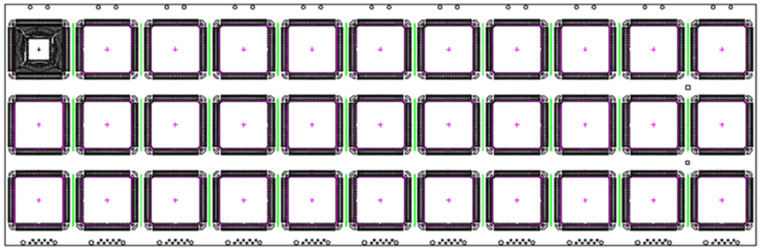
**Current Lead Frame Layout | 36 x 249mm**



## QFP Advancement

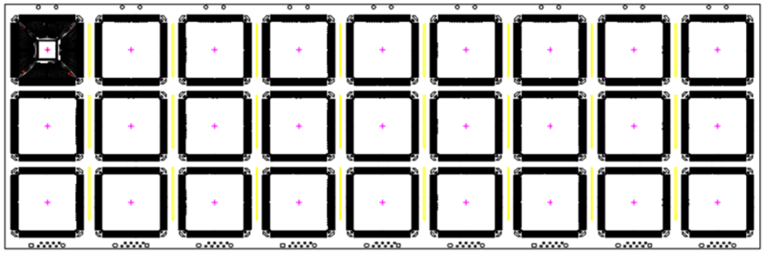
| Package | | Lead Frame | Lead frame finish | PKG Terminal Finish |
|---|---|---|---|---|
| 20x20 | Exposed Pad | Layout \| 3 x 11 | Base Material Cu<br>Pre-plated NEAP | Sn |
| 24x24 | Exposed Pad | Layout \| 3 x 9 | Base Material Cu<br>Pre-plated NEAP | |

**New Lead Frame Layout | 100 x 300mm**



▲ TQFP 20x20

LQFP 24x24 ▼



# QFP Advancement

## ST KIRKOP

## QFP Advancement

| Package | | Lead Frame | Lead frame finish | Terminal Finish |
|---|---|---|---|---|
| 20x20 | Exposed Pad | Layout \| 3 x 11 | Base Material Cu<br>Pre-plated NEAP | Sn |
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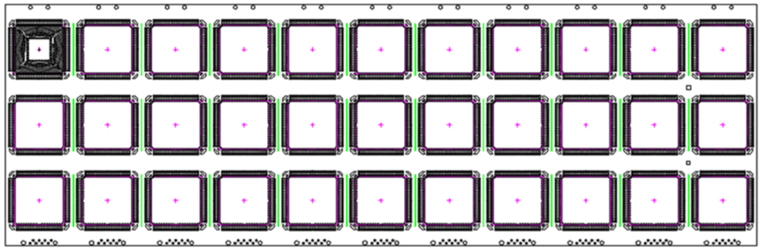
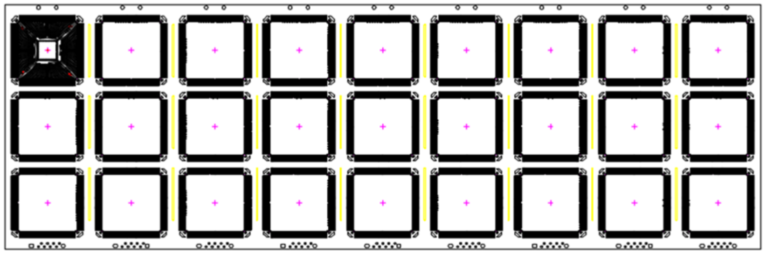
**New Lead Frame Layout | 100 x 300mm**



▲ TQFP 20x20

LQFP 24x24 ▼

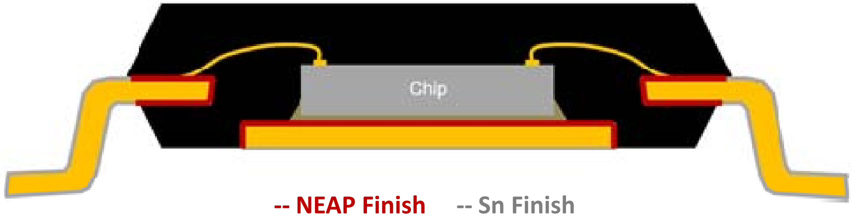


Leadframe Finish NEAP **N**on-**E**tched **A**dhesion **P**romoter

NEAP Surface Finish for Package Reliability | Adhesion Enhancement

Button Shear Adhesion Test | EMC adhesion increases by more than 2 folds.

Package Reliability is the same as the current *μrough* Pre- Plated Leadframe.



**-- NEAP Finish** -- Sn Finish

# Public Products List

Publict Products are off the shelf products. They are not dedicated to specific customers, they are available through ST Sales team, or Distributors, and visible on ST.com

***PCN Title :*** SPC58NH92x (FC92): Activation of Additional Diffusion Plant and Package Upgrade

***PCN Reference :*** ADG/21/12778

***Subject :*** Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

| | | |
|---|---|---|
| **SPC58NH92C3RMI0X** | **SPC58NH92C5RMI0X** | **SPC58NH92E7RMI0X** |

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