

PRODUCT / PROCESS CHANGE INFORMATION

1. PCI basic data

| | |
|----------------------|--|
| 1.1 Company |  STMicroelectronics International N.V |
| 1.2 PCI No. | MICROCONTROLLERS/24/14814 |
| 1.3 Title of PCI | Microcontrollers (FC70, FC80): Activation "HDS" as Second Lead Frame Supplier (QFP100 14x14 Malta) |
| 1.4 Product Category | see list |
| 1.5 Issue date | 2024-06-26 |

2. PCI 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 |
|--------------|--|----------------------------|
| Materials | New direct material part number (same supplier, different supplier or new supplier), Lead frame finishing material / area (internal) | ST Kirkop - Malta |

4. Description of change

| | Old | New |
|---|----------------------------|-------------------------------------|
| 4.1 Description | SHINKO Lead-Frame Supplier | SHINKO and HSD Lead-Frame Suppliers |
| 4.2 Anticipated Impact on form,fit, function, quality, reliability or processability? | No Impact | |

5. Reason / motivation for change

| | |
|----------------------|-----------------|
| 5.1 Motivation | Dual Sourcing |
| 5.2 Customer Benefit | DOUBLE SOURCING |

6. Marking of parts / traceability of change

| | |
|-----------------|-----------------------|
| 6.1 Description | Internal traceability |
|-----------------|-----------------------|

7. Timing / schedule

| | |
|-------------------------------------|--------------|
| 7.1 Date of qualification results | 2024-06-11 |
| 7.2 Intended start of delivery | 2024-09-30 |
| 7.3 Qualification sample available? | Upon Request |

8. Qualification / Validation

| | | | |
|--|----------------------------|------------|------------|
| 8.1 Description | 14814 Details.pdf | | |
| 8.2 Qualification report and qualification results | Available (see attachment) | Issue Date | 2024-06-26 |

9. Attachments (additional documentations)

| |
|--------------------------|
| 14814 Public product.pdf |
| 14814 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 |
| | SPC584B70E3EHC0X | |
| | SPC58EC80E3G0C1X | |
| | SPC58EC80E3QMC1X | |

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QFP Product Line

Internal Process Change – Qualification of New Leadframe Supplier (Qualified Supplier)

Device CHORUS 2M & CHORUS 4M in eTQFP 14x14

ST MALTA

Report: May 2024



ST Restricted

Qualification Report Leadframe 5FT30182

Product Line Chorus 2M (FC70) & Chorus 4M (FC80) in eTQFP 14x14

Aim of this document is to report the results for the qualification of a change in the Leadframe for the assembly of Chorus 2M and Chorus 4M in eTQFP 100L assembled in Malta.

Purpose of the change is to qualify dual source for Leadframe in eTQFP100 package, with the purpose to secure supply chain.

Assembly change related to new Leadframe source include:

- Leadframe finishing (pre-plated from “Ni Pd Au” to “Ni Pd AuAg”)
- Leadframe unit design (minor differences).

The Leadframe Unit Design, Leadframe Finish and Leadframe supplier are the same as the qualified product in ST MUAR.

Elements which are not affected by the change are:

- Leadframe Material (Base Material and Lead Locking Tape)
- Internal Dimensional: Length and Layout of Lead Fingers (i.e. wire loop lengths)
- External Dimensions: Lead Geometry

Comparison between current and new Leadframe is reported in slides 5-6.

Qualification performed on 2 Lots Chorus 2M and 1 Lot Chorus 4M.

Qualification Report Leadframe 5FT30182

Product Line Chorus 2M (FC70) & Chorus 4M (FC80) in eTQFP 14x14

| RELIABILITY TEST CONDITION | READOUTS | SAMPLE | COMMENTS & RESULTS |
|---|---|--------|--|
| Pre Conditioning MSL 3 + 100 TC [AEC Q100-001] 24h bake@125°C, 192h@30°C/60%RH 3x Reflow simulation (Peak 260°C) | <input type="checkbox"/> Testing at Room <input checked="" type="checkbox"/> Testing at Hot <input checked="" type="checkbox"/> Sonoscan | 77 x 3 | 2 Qualification Lots CHORUS 2M 1 Qualification Lot CHORUS 4M Electrical READOUTS 100% PASS Sonoscan (T/C-SAM) 100% PASS |
| Temperature Cycling TC 2K [JESD22-A104] After Pre-Conditioning (MSL 3) Ta= -55°C +150 °C 2000cyc AEC-Q006 | <input checked="" type="checkbox"/> Testing at Room <input checked="" type="checkbox"/> Testing at Hot <input checked="" type="checkbox"/> Sonoscan | 77 x 3 | 2 Qualification Lots CHORUS 2M 1 Qualification Lot CHORUS 4M Electrical READOUTS 100% PASS Sonoscan (T/C-SAM) 100% PASS |
| Autoclave AC 96 Hours [JESD22-A102/A118] After Pre-Conditioning (MSL 3) P=2.08atm Ta=121°C, 96hrs | <input checked="" type="checkbox"/> Testing at Room <input checked="" type="checkbox"/> Testing at Hot <input checked="" type="checkbox"/> Sonoscan | 77 x 3 | 2 Qualification Lots CHORUS 2M 1 Qualification Lot CHORUS 4M Electrical READOUTS 100% PASS Sonoscan (T/C-SAM) 100% PASS |

Report Conclusion

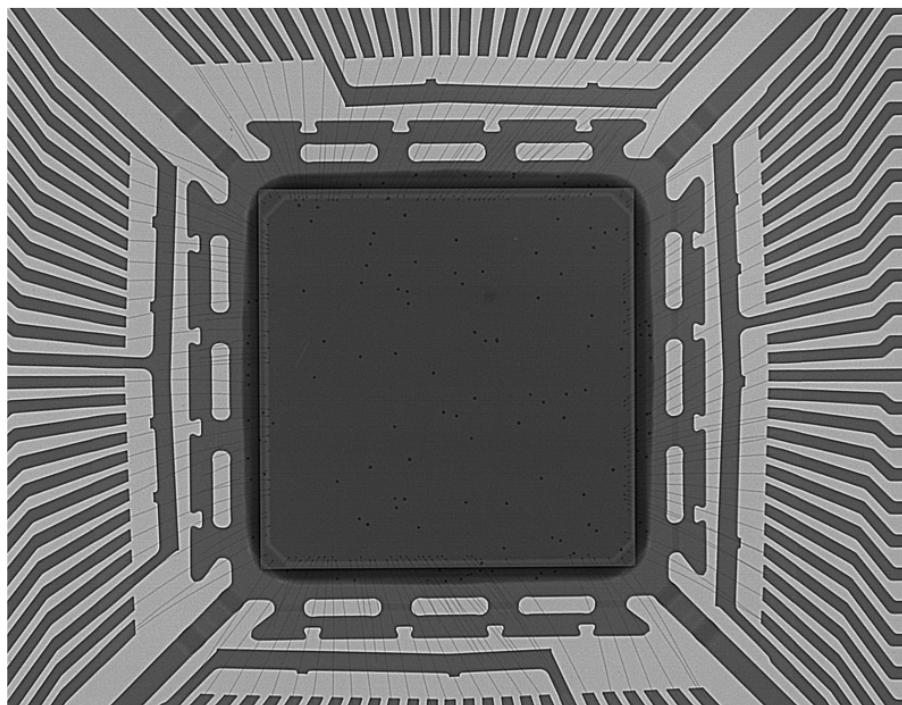
Product Line Chorus 2M (FC70) & Chorus 4M (FC80) in eTQFP 14x14

The Qualification results (AEC-Q100 Grade 1 and AEC-Q006 milestones) of the new Leadframe part number 5FT30182 sourced from HDS (an already qualified supplier on QFP Automotive Product Line) have been positively achieved.

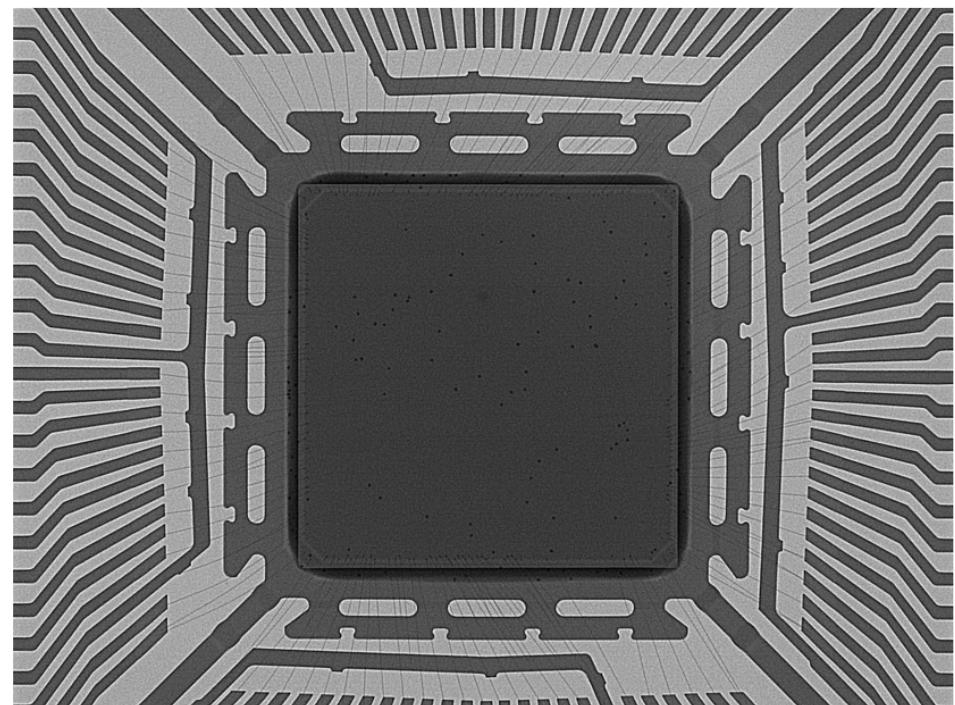
5

Finished Device X-Ray Visual Analysis

Product Line Chorus 4M



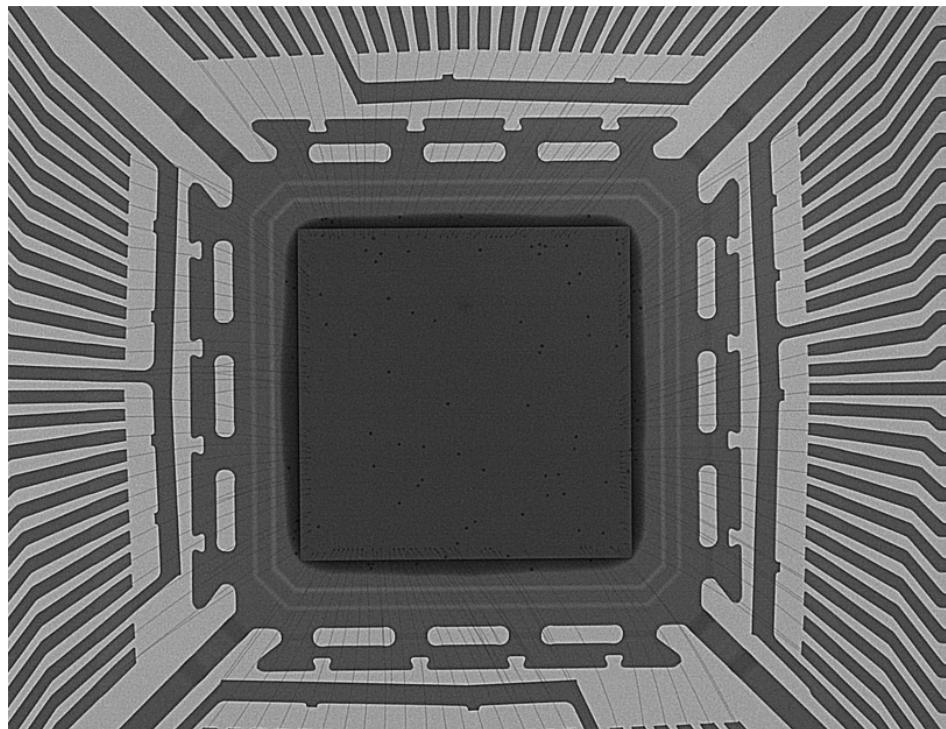
▲ Current Leadframe



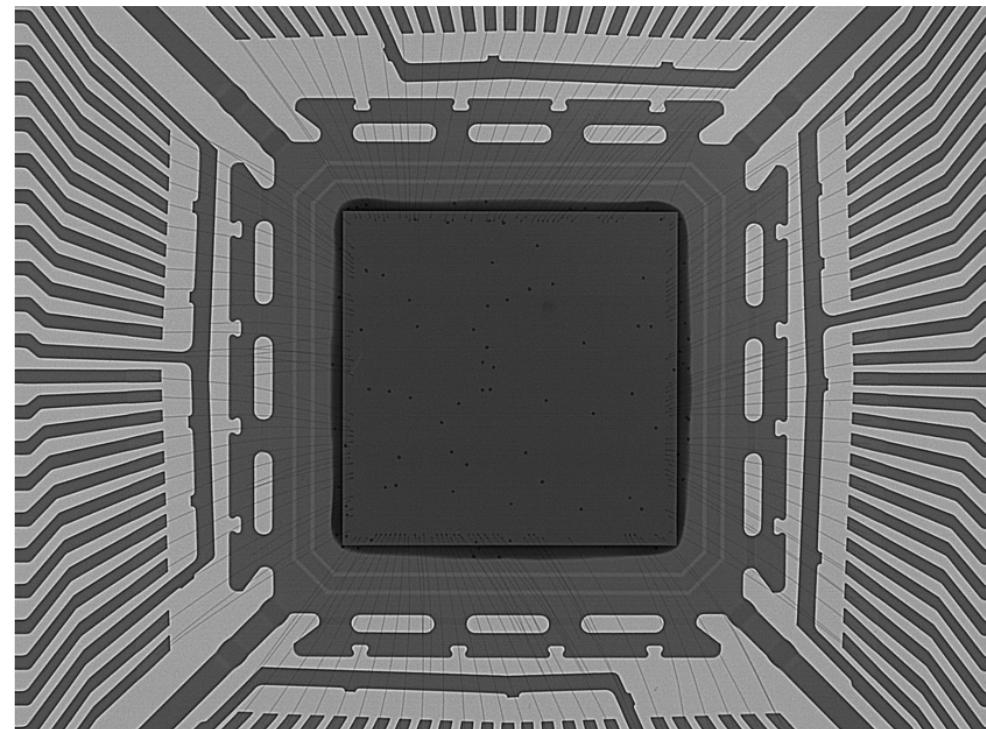
▲ New Leadframe

Finished Device X-Ray Visual Analysis

Product Line Chorus 2M



▲ Current Leadframe



▲ New Leadframe

Public Products List

Public 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

PCI Title : Microcontrollers (FC70, FC80): Activation "HDS" as Second Lead Frame Supplier (QFP100 14x14 Malta)

PCI Reference : MICROCONTROLLERS/24/14814

Subject : Public Products List

Dear Customer,

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

| | | |
|------------------|------------------|------------------|
| SPC58EC80E3QMC1X | SPC584C70E3GMC1X | SPC584B60E3MHC0X |
| SPC58EC70E3F001X | SPC584B60E3BDC0X | SPC584C70E3E0K1X |
| SPC58EC80E3G001X | SPC584C70E3FMC1X | SPC58EC74E3FMC1X |
| SPC58EC80E3F0C1X | SPC584C74E3QEC1X | SPC584B70E3NMC0X |
| SPC58EC80E3G0C1X | SPC584C80E3G0C1X | SPC584B64E3CDC0X |
| SPC58EC80E3FMC1X | SPC584C70E3N0I1X | SPC584C70E3F001X |
| SPC584B70E3EHC0X | SPC584B70E3NDC0Y | SPC584B64E3ND00X |
| SPC584B70E3CD00X | | |

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