

Introduction

A System-On-Module (SOM) is mounted on a motherboard in the same way as other SMT components by using a Pick & Place machine.

The Pick & Place machine, defined by the CAD placement file, often picks the SMT components by their center of gravity. Applying this rule to a SOM is not a reliable solution during the assembly phase because the module's center of gravity is not necessarily aspirable by the nozzle, as it may correspond to a position half on a component and half on the PCB.

This application note provides Pick & Place characteristics for Microchip SOM variants.

Related Document

Document Type	Title	Available
Application Note	AN5429 - System-On-Module (SOM) Assembly and Storage Guidelines	www.microchip.com

1. Generic Settings

Mounting the SOM on a motherboard requires a specific Pick & Place machine set-up described in the following notes and paragraphs.

For an accurate SOM placement, it is necessary to:

- Position the nozzle in the area defined for module placement on the motherboard using the camera in self-learning mode. The presence of a label will not affect the Pick & Place.
- Define the nozzle type.
- Define speed of movement and other parameters.

Note that the offset from the center is calculated by the machine.

Note: For optimal alignment and positioning, the nozzle internal diameter should be between 6 and 10 mm. The larger the nozzle diameter, the better the component alignment and positioning.

Note: In case of non-use of Microchip tray(s), the tray(s) must be opened under the module to avoid any suction during module manipulation by the Pick & Place machine.

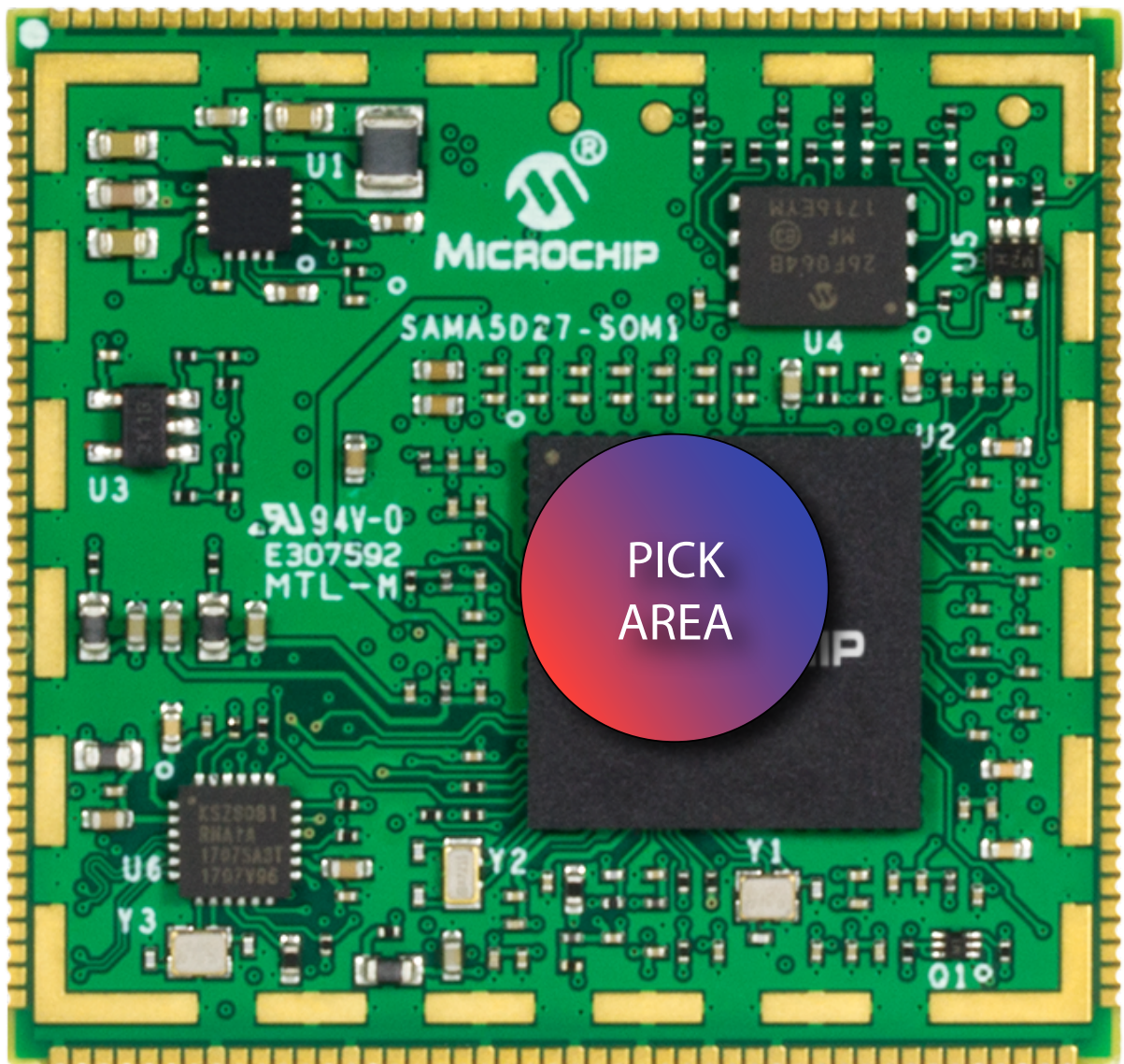
2. SAMA5D27 SOM Pick & Place

The **SAMA5D27 SOM**, with a **5.4g** net weight, has a non-homogeneous weight distribution. To ensure an accurate Pick & Place, the following Pick & Place machine settings must be applied:

- X-Y and rotation speed must be set to a minimum (very low speed)
- Vacuum duration: 600 ms to 1s
- Z speed: 30 mm/s
- Force: 3.5 newton

The pick area designated below must be respected to ensure accurate placement of the module on the motherboard.

Figure 2-1. SAMA5D27 SOM Pick & Place Area



The images below show the camera and operator views of the SAMA5D27 SOM on a Mydata Pick & Place machine.

Figure 2-2. SAMA5D27 SOM Pick & Place Camera View

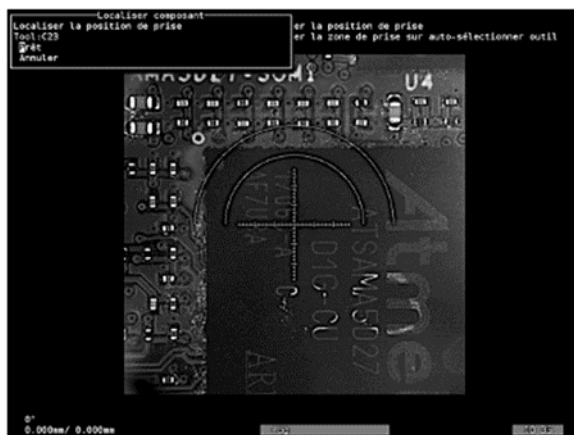
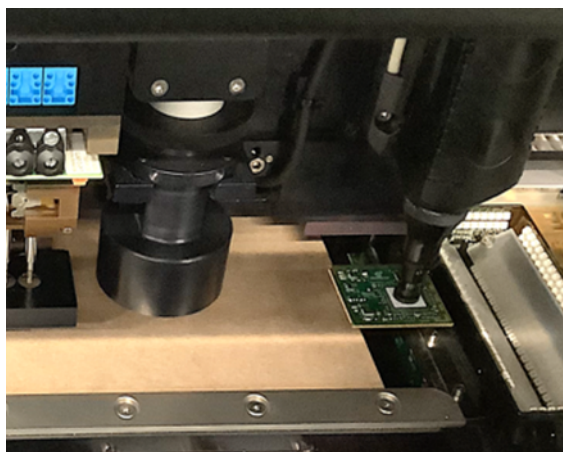


Figure 2-3. SAMA5D27 SOM Pick & Place Operator View



3. SAMA5D27 WLSOM Pick & Place

The **SAMA5D27 WLSOM**, with a **7.91g** net weight, has a non-homogeneous weight distribution. To ensure an accurate Pick & Place, the following Pick & Place machine settings must be applied:

- X-Y and rotation speed must be set up to a minimum (very low speed)
- Vacuum duration: 600 ms to 1s
- Z speed: 30 mm/s
- Force: 3.5 newton

The pick area designated below must be respected to ensure accurate placement of the module on the motherboard.

Figure 3-1. SAMA5D27 WLSOM Pick & Place Area



The images below show the camera and operator views of the SAMA5D27 WLSOM on a Mydata Pick & Place machine.

Figure 3-2. SAMA5D27 WLSOM Pick & Place Camera View

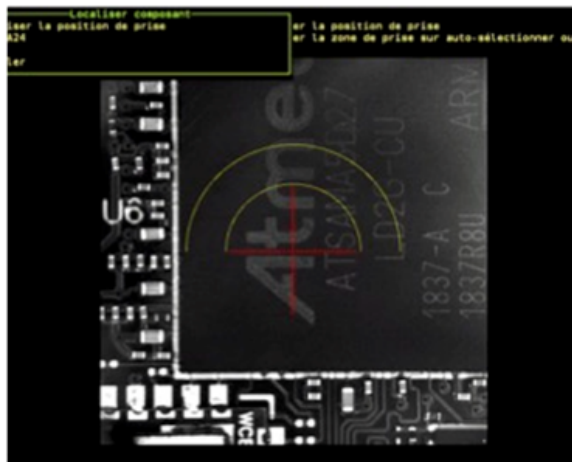


Figure 3-3. SAMA5D27 WLSOM Pick & Place Operator View



4. SAM9X60D1G SOM Pick & Place

The **SAM9X60D1G SOM**, with a **3.6g** net weight, has a non-homogeneous weight distribution. To ensure an accurate Pick & Place, the following Pick & Place machine settings must be applied:

- X-Y and rotation speed must be set to a minimum (very low speed)
- Vacuum duration: 400 ms to 600 ms
- Z speed: 50 mm/s
- Force: 3.5 newton

The pick area designated below must be respected to ensure accurate placement of the module on the motherboard.

Figure 4-1. SAM9X60D1G SOM Pick & Place Area

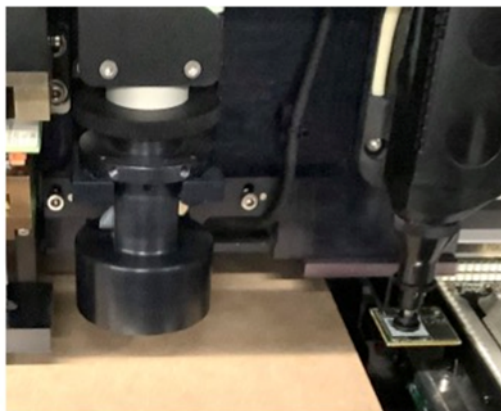


The images below show the camera and operator views of the SAM9X60D1G SOM on a Mydata Pick & Place machine.

Figure 4-2. SAM9X60D1G SOM Pick & Place Camera View



Figure 4-3. SAM9X60D1G SOM Pick & Place Operator View



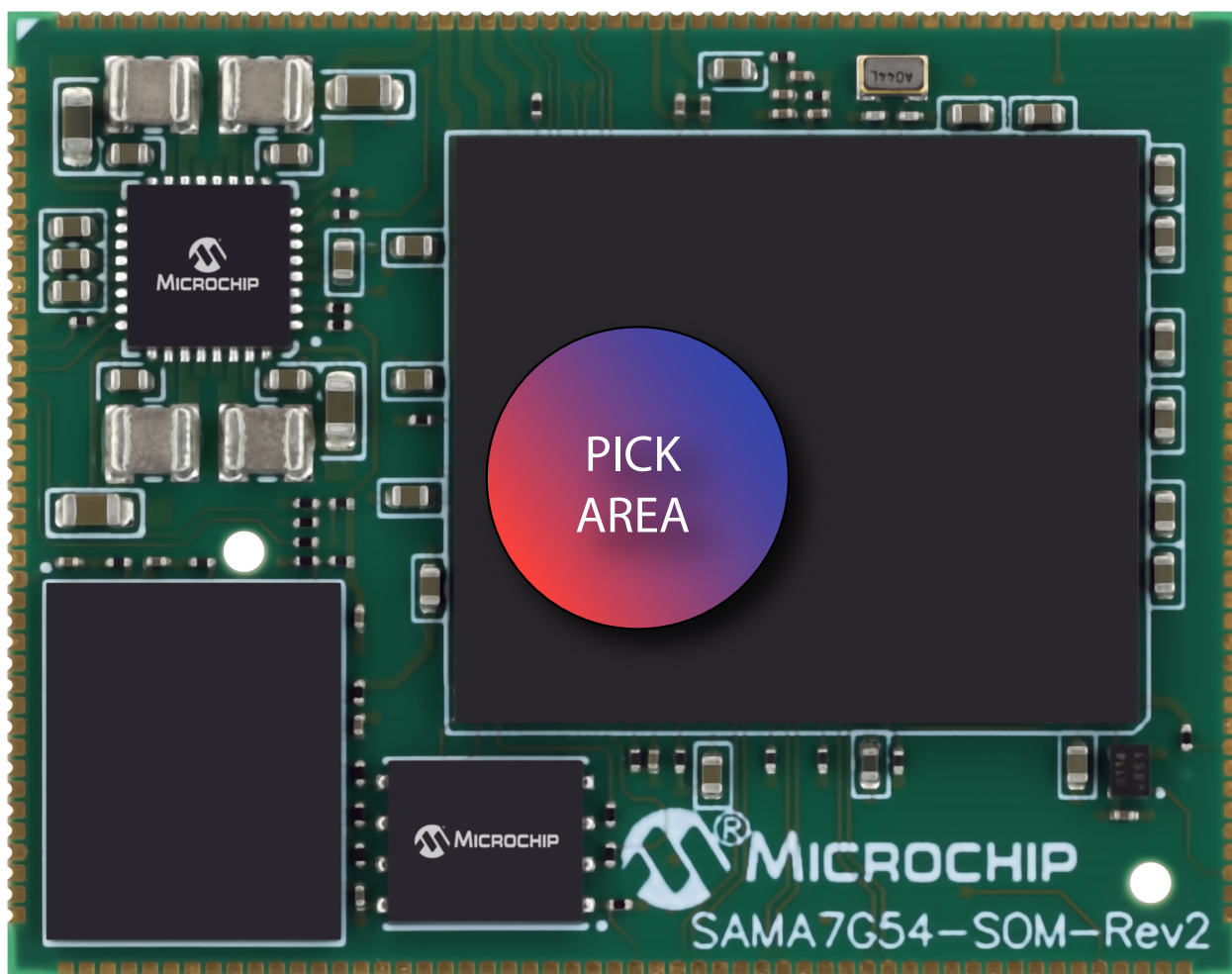
5. SAMA7G54 SOM Pick & Place

The **SAMA7G54 SOM**, with a net weight of up to **6.21g**, has a non-homogeneous weight distribution. To ensure an accurate Pick & Place, the following Pick & Place machine settings must be applied:

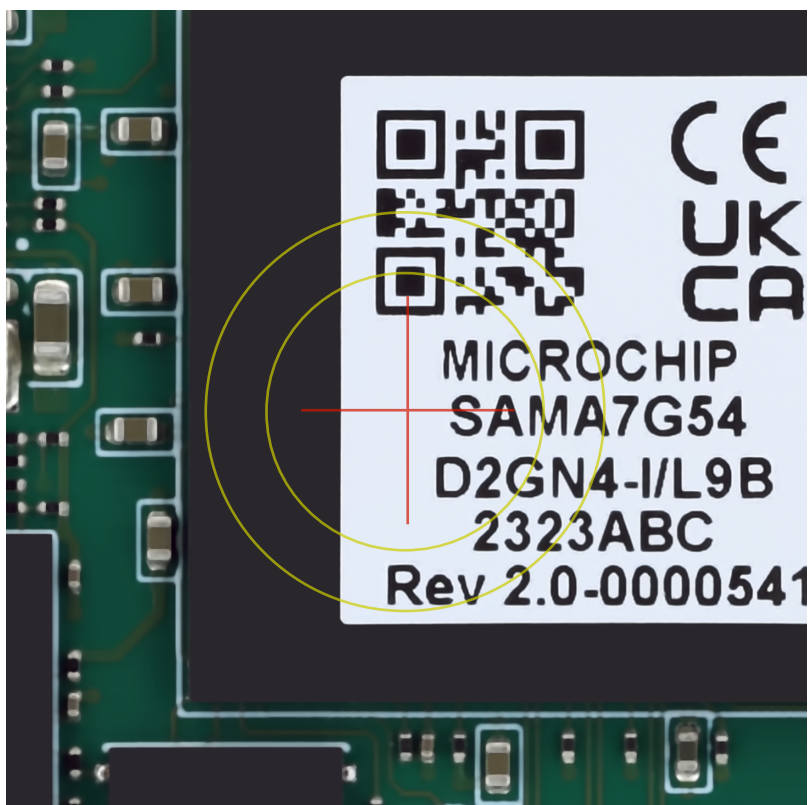
- X-Y and rotation speed must be set to a minimum (very low speed)
- Vacuum duration: 600 ms to 1 s
- Z speed: 30 mm/s
- Force: 3.5 newton

The pick area designated below must be respected to ensure accurate placement of the module on the motherboard.

Figure 5-1. SAMA7G54 SOM Pick & Place Area



The image below shows the camera and operator views of the SAMA7G54 SOM on a Mydata Pick & Place machine.

Figure 5-2. SAMA7G54 SOM Pick & Place Camera View

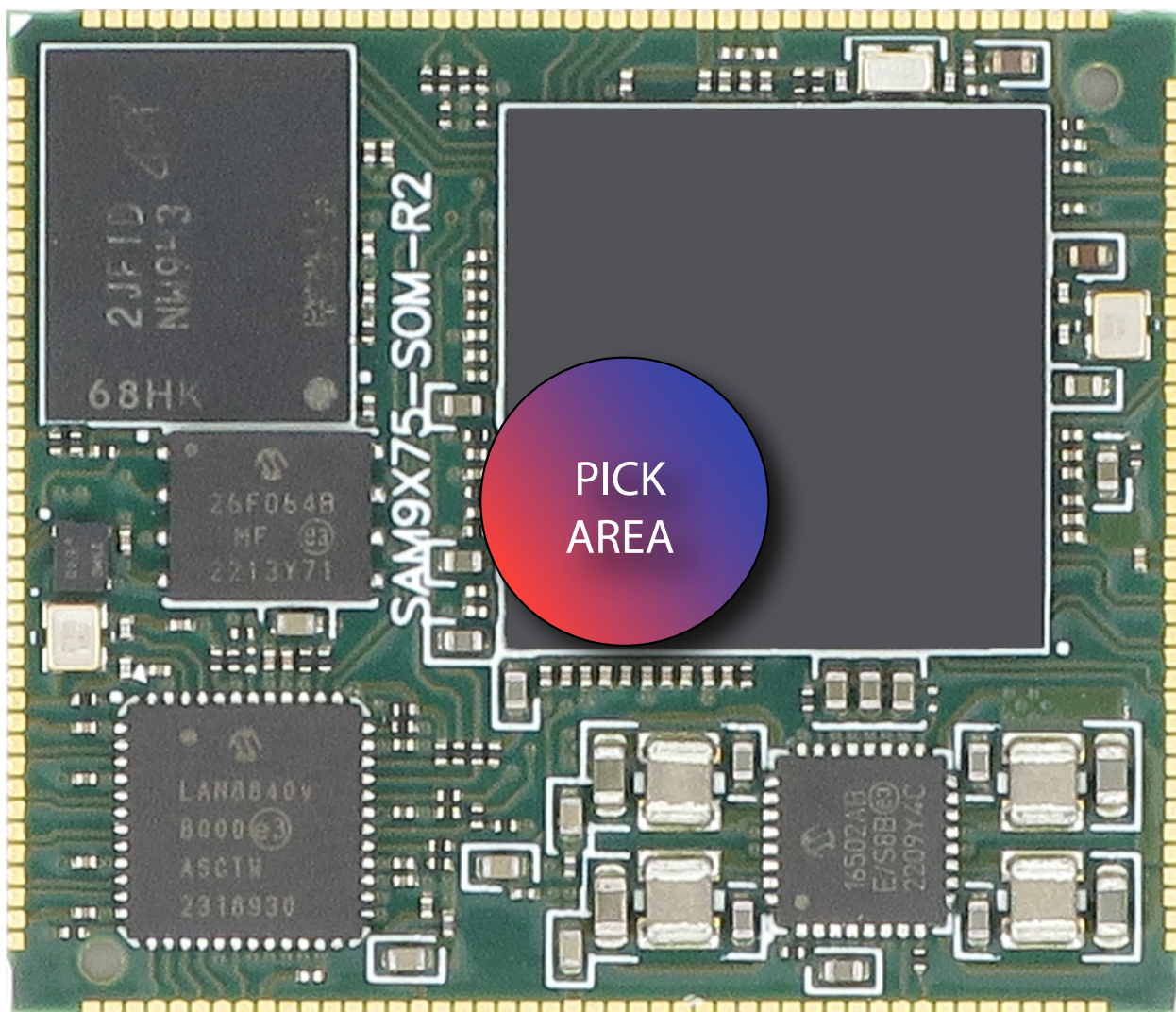
6. SAM9X75 SOM Pick & Place

The **SAM9X75 SOM**, with a net weight of up to **5.50g**, has a non-homogeneous weight distribution. To ensure an accurate Pick & Place, the following Pick & Place machine settings must be applied:

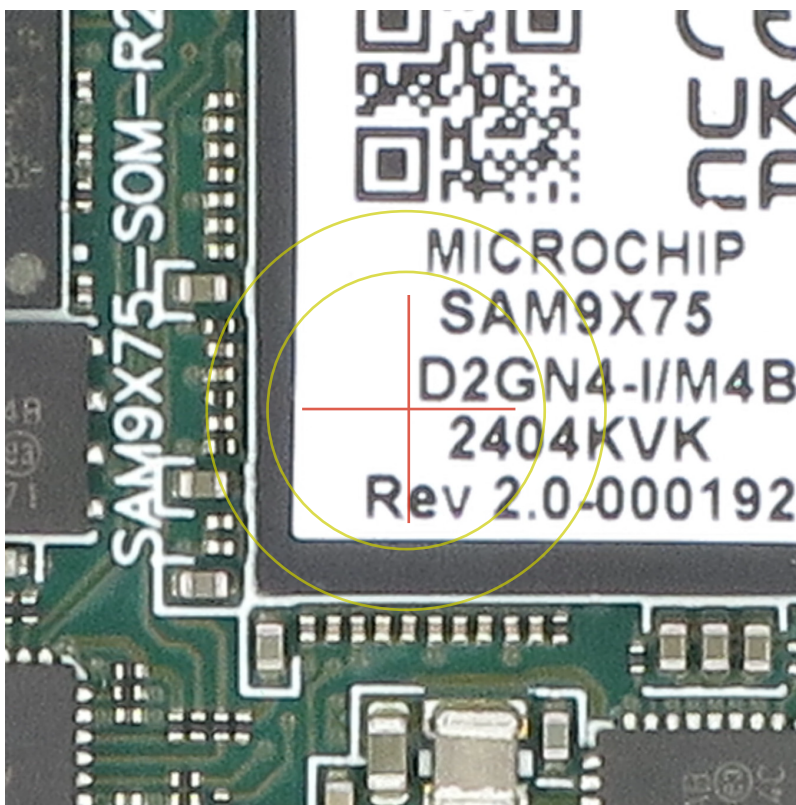
- X-Y and rotation speed must be set to a minimum (very low speed)
- Vacuum duration: 600 ms to 1 s
- Z speed: 30 mm/s
- Force: 3.5 newton

The pick area designated below must be respected to ensure accurate placement of the module on the motherboard.

Figure 6-1. SAM9X75 SOM Pick & Place Area



The image below shows the camera and operator views of the SAM9X75 SOM on a Mydata Pick & Place machine.

Figure 6-2. SAM9X75 SOM Pick & Place Camera View

7. Revision History

7.1 Rev. B - 07/2024

Added:

- [Related Document](#)
- [SAMA7G54 SOM Pick & Place](#)
- [SAM9X75 SOM Pick & Place](#)

7.2 Rev. A - 01/2023

First issue.

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