Application note

FXPS7140x pressure sensor traceability methods

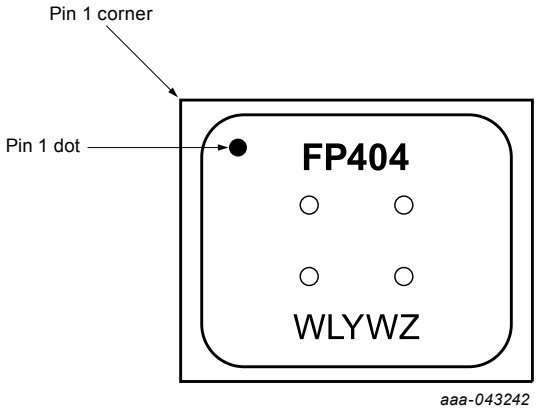
Introduction

This application note provides a comprehensive way to locate and determine detailed traceability information of the MEMS and the ASIC components in the FXPS7140x pressure sensor. This information is provided in the event the device is functional, where the user has the ability to read the register map or in the event the device is non-functional.

1 Package method tracing

This section describes the identification package markings on the FXPS7140x pressure sensor.
Figure 1. Package marking shows the package markings, specifically what the lettering and numbering trace to. For example, WL = wafer lot, YW = year and work week, and Z = sublot

Figure 1. Package marking



2 Functional FXPS7140x device traceability method

The following sections describe the situation where the FXPS7140x pressure sensors register map is readable by the user and traceability of the ASIC components are attainable by reading the registers.

Note: In this application note, 'Traceability' means the set of registers to read that provide the user with the necessary information to trace the device back to the wafer lot of the manufacturer.

To read the traceability registers in the FXPS7140x pressure sensors register map, the proper procedure and setup of the UF Region selection registers must be followed.

The UF region load register is a user read/write register that contains the control bits for the UF0 and UF1 regions to be accessed. This information is detailed in the UF Region selection registers ($14 and $15) description and procedures in the FXPS7140x data sheet.

If the FXPS7140x pressure sensors register map is functional and readable by the user, then traceability of the ASIC components back to the wafer lot can be done by reading specific registers of the device.

Table 1. SNx – device serial number registers – (address $C6 to $C9, $CA) bit allocation shows the serial number registers, $C6 to $CA. These registers are factory programmed OTP registers which include the unique serial number of the device set by ST. Registers $C6 to $CA provide the serial number of the device.

Table 1. SNx – device serial number registers – (address $C6 to $C9, $CA) bit allocation

Address	Name	Bit							
		7	6	5	4	3	2	1	0
$C6	SN0	SN[7:0]							
$C7	SN1	SN[15:8]							
$C8	SN2	SN[23:16]							
$C9	SN3	SN[31:24]							
$CA	SN4	SN[39:32]							
Reset		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Access		R	R	R	R	R	R	R	R

Depending on the lot size and quantities, all possible serial numbers may not be assigned.

The ASIC wafer ID registers are factory programmed OTP registers which include the wafer number, wafer X and Y coordinates and the wafer lot number for the device ASIC. Table 2. ASICWFR# – ASIC wafer ID register – (address $CB) bit allocation, Table 3. ASICWFR_x – ASIC wafer x, y coordinates ID registers – (address $CC, $CD) bit allocation and Table 4. ASICWLOT_x – ASIC wafer lot ID registers – (address $D0, $D1) bit allocation show these registers respectively.

Table 2. ASICWFR# – ASIC wafer ID register – (address $CB) bit allocation

Bit	7	6	5	4	3	2	1	0
Symbol	ASICWFR#[7:0]							
Reset	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Access	R	R	R	R	R	R	R	R

Table 3. ASICWFR_x – ASIC wafer x, y coordinates ID registers – (address $CC, $CD) bit allocation

Address	Name	Bit							
		7	6	5	4	3	2	1	0
$CC	ASICWFR_X	ASICWFR_X[7:0]							
$CD	ASICWFR_Y	ASICWFR_X[7:0]							
Reset		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Access		R	R	R	R	R	R	R	R

Table 4. ASICWLOT_x – ASIC wafer lot ID registers – (address $D0, $D1) bit allocation

Address	Name	Bit							
		7	6	5	4	3	2	1	0
$D0	ASICWLOT_L	ASICWLOT_L[7:0]							
$D1	ASICWLOT_H	ASICWLOT_H[7:0]							
Reset		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Access		R	R	R	R	R	R	R	R

Note: When ENDINIT is not set, these registers can be read in DSI3 mode or PSI5 diagnostic mode.

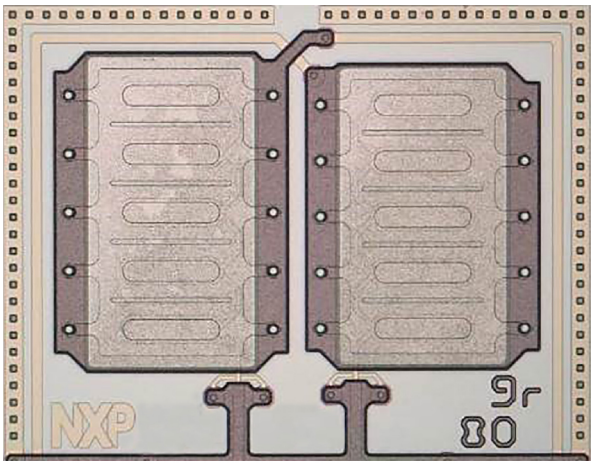
3 Non-functional FXPS7140x device traceability method

This section describes the method to identify the wafer lot traceability of a non-functional FXPS7140x pressure sensor. In this case, the register map is not accessible by the user and the device must be sent back to ST.

Note: A 'non-functional' FXPS7140x pressure sensor in this context means the user cannot communicate with the device.

ST removes the lid of the device and determines the MEMS die Y and die X. Using MEMS traceability, lid markings and the device markings shown in Figure 2. FXPS7140x MEMS wafer die Y, die X coordinates, (80, 9r), ST determines the complete device traceability.

Figure 2. FXPS7140x MEMS wafer die Y, die X coordinates, (80, 9r)



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Revision history

Table 5. **Revision history**

Date	Version	Changes
09-Oct-2026	1	Initial release from ST, rebranded NXP document

Contents

1 Package method tracing 2
2 Functional FXPS7140x device traceability method 3
3 Non-functional FXPS7140x device traceability method 5
Revision history 6
List of tables 8
List of figures 9

List of tables

Table 1. SNx – device serial number registers – (address $C6 to $C9, $CA) bit allocation . . . 3
Table 2. ASICWFR# – ASIC wafer ID register – (address $CB) bit allocation . . . 3
Table 3. ASICWFR_x – ASIC wafer x, y coordinates ID registers – (address $CC, $CD) bit allocation . . . 3
Table 4. ASICWLOT_x – ASIC wafer lot ID registers – (address $D0, $D1) bit allocation . . . 4
Table 5. Revision history . . . 6

List of figures

Figure 1. Package marking 2
Figure 2. FXPS7140x MEMS wafer die Y, die X coordinates, (80, 9r) 5

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