

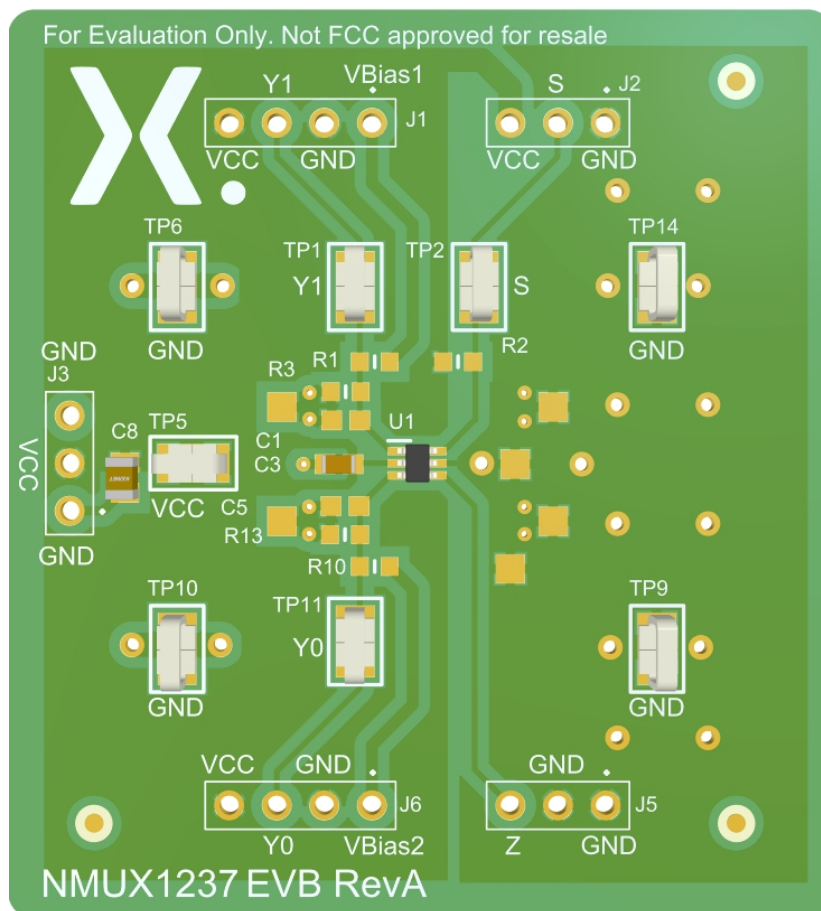


UM90037

Rev. 1 — 18 July 2024

user manual

NMUX1237; 2-channel analog multiplexer/demultiplexer evaluation board



Abstract: This user manual describes the NMUX1237 evaluation board module.

Keywords: NMUX1237; 2-channel analog multiplexer/demultiplexer evaluation board (EVB)

1. Introduction

The NMUX1237 is a versatile CMOS bidirectional (SPDT) single-pole double-throw analog switch with digital control pins that support 1.8 V logic thresholds independent of the supply voltage.

Supporting a wide supply voltage range of 1.08 V to 5.5 V, the device additionally features integrated circuitry to minimize analog signal overshoot when switching between channels. No power sequencing is required, as both digital and analog back-power protection are implemented.

The evaluation board (EVB) arrives enclosed in an antistatic ESD bag with labeling. The board's silkscreen text allows for an easy reference to pin names and locations. Convenient test points for GND, V_{CC} , Yn, Z, and S pins are included as well. Footprints for 0603 resistors and capacitors are also included on the two analog channels, allowing the user to create a customized voltage divider if needed.

Key parameters and features

The list below gives a summary of the key parameters and most important features of the NMUX1237.

- Integrated suppression circuit to minimize signal overshoot.
- Wide operating range: 1.08 V to 5.5 V
- Control signal pins maintains 1.8 V logic compatibility across fully supply operating range.
- Rail-to-Rail operation on analog signal pins
- Break-before-make switching.
- Very low ON-resistance: 4 Ω (typical)
- Specified from -40 °C to +85 °C and from -40 °C to +125 °C

2. Hardware setup

Higher level configuration summary:

- Test points on V_{CC} , GND, Yn, Z, and S pins
- Passive footprints for customized divider circuit
- Selectable header shunts to connect inputs to V_{CC} or GND
- Board supports NMUX1237GW (TSSOP6/SOT363-2) footprints.

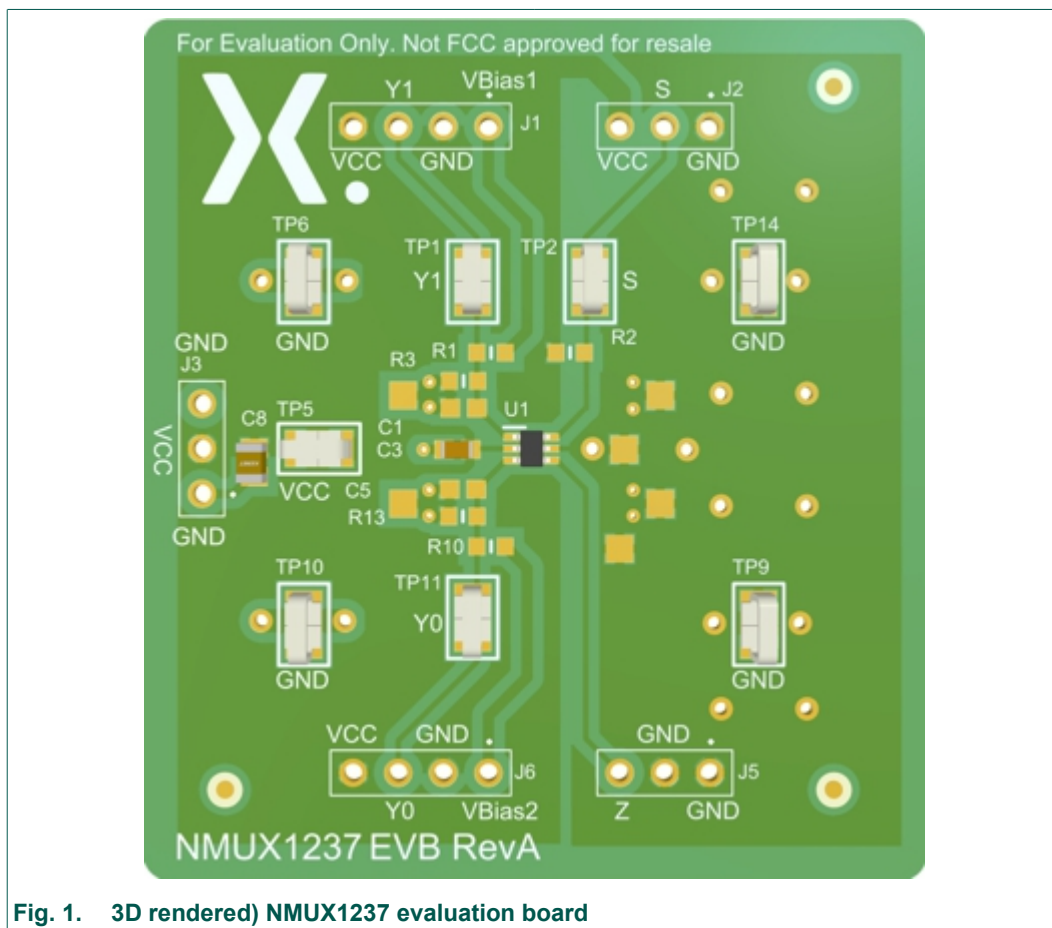


Fig. 1. 3D rendered) NMUX1237 evaluation board

3. Test points V_{CC} [+] and GND [-]

TP5 (V_{CC}) and TP6, TP9, TP10, TP14 (GND), or J3, serve as the physical connection for the external supply. A portion of the top plane connects to V_{CC}, while the bottom and top right planes connect to GND. Device input pins, Y_n, can connect to V_{CC} or GND through their respective 2.54 mm shunt locations. This is illustrated in [Table 1](#) and [Table 2](#).

Table 1. Detailed description of supply connections

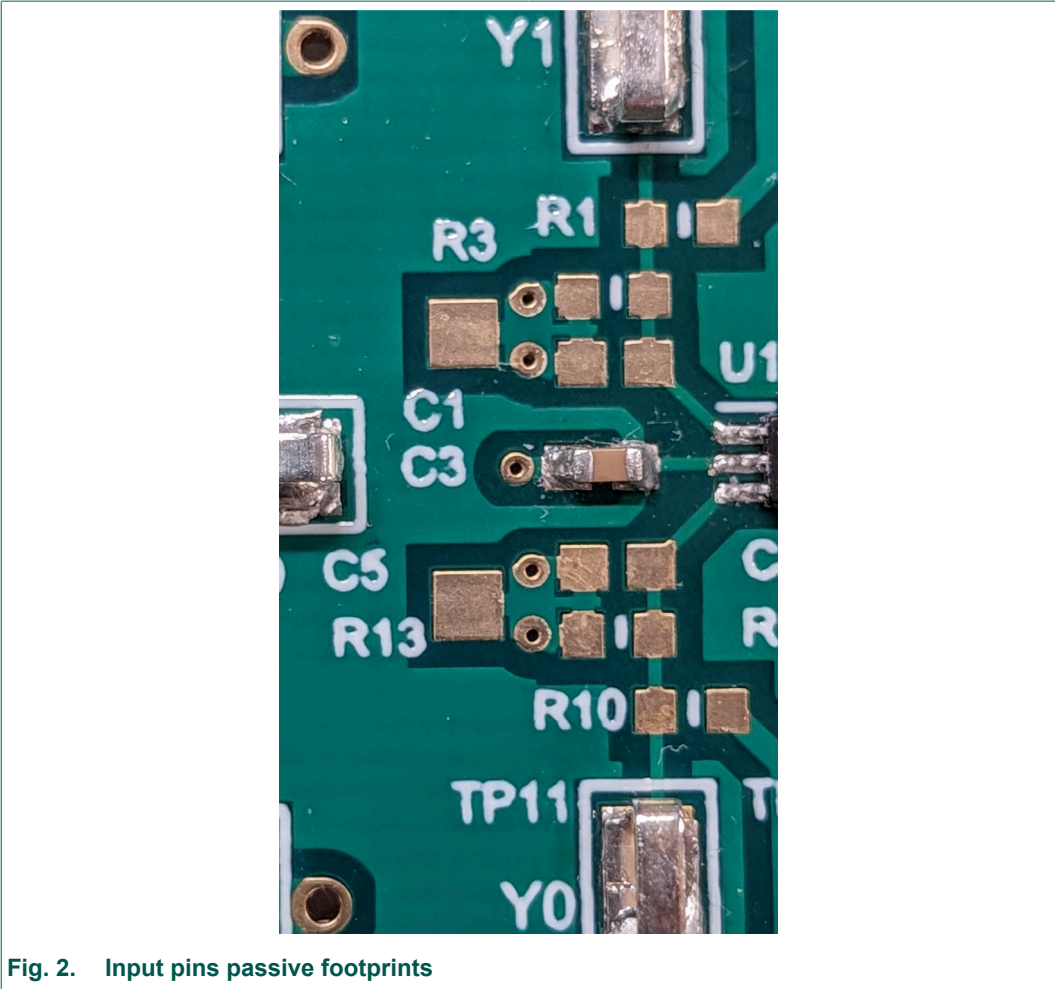
Symbol net names	Header/Pin number	Description
V _{CC}	TP5 or J3	External supply V _{CC} connection
GND	TP6, TP9, TP10, TP14 or J3	External supply GND connection

Each pin of the device is brought out to a male header. The user can directly make connections to their respective headers or attach clips to their respective test points. Additionally, the analog inputs Y_n can be manually connected to V_{CC} or GND through 2.54 mm shunts.

Table 2. Detailed description of the header

NMUX1237 pin number	Header connection	Test point clip label	NMUX1237 pin name	2.5 mm shunt connection description
1	J1-3	TP1	Y1	<ul style="list-style-type: none">3-2 GND [-]4-3 V_{CC} [+]
2	J3-2	TP5	V _{CC}	NA
3	J6-3	TP11	Y0	<ul style="list-style-type: none">3-2 GND [-]4-3 V_{CC} [+]
4	J5-3	NA	Z	NA
5	NA	TP6, TP9, TP10, TP14	GND	NA
6	J2-2	TP2	S	<ul style="list-style-type: none">1-2 GND [-]2-3 V_{CC} [+]

The analog pins of the NMUX1237 evaluation board include options to integrate pull-up/pull-down resistors, which can also be optionally populated to allow a voltage divider network for header pin V_{bias}. This is accomplished by populating the 0603 footprints on the EVB. Additionally, 0603 ceramic capacitor footprints are also included in case the user wishes to add capacitance to the signal net.



4. Schematic diagram

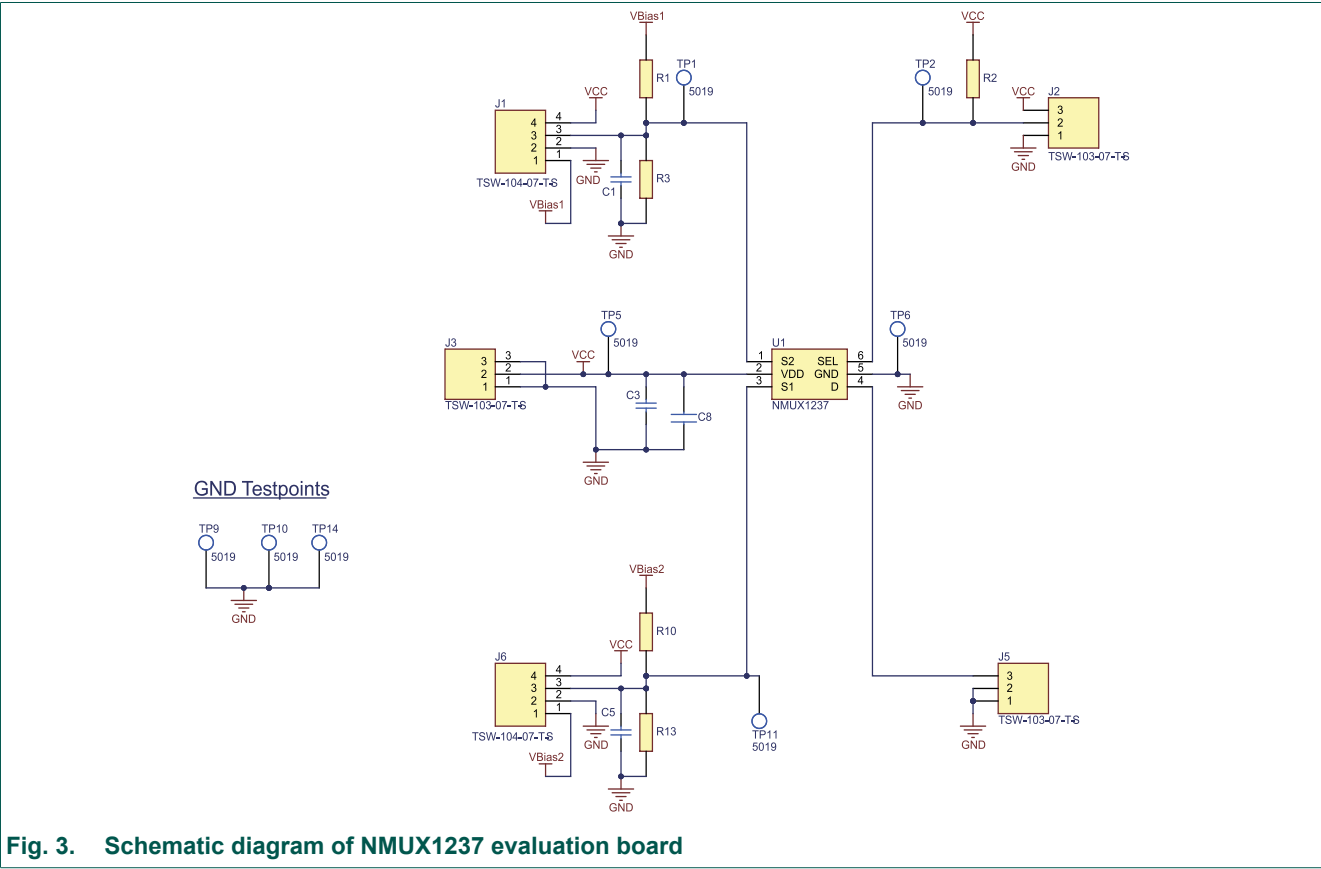


Fig. 3. Schematic diagram of NMUX1237 evaluation board

5. PCB layout

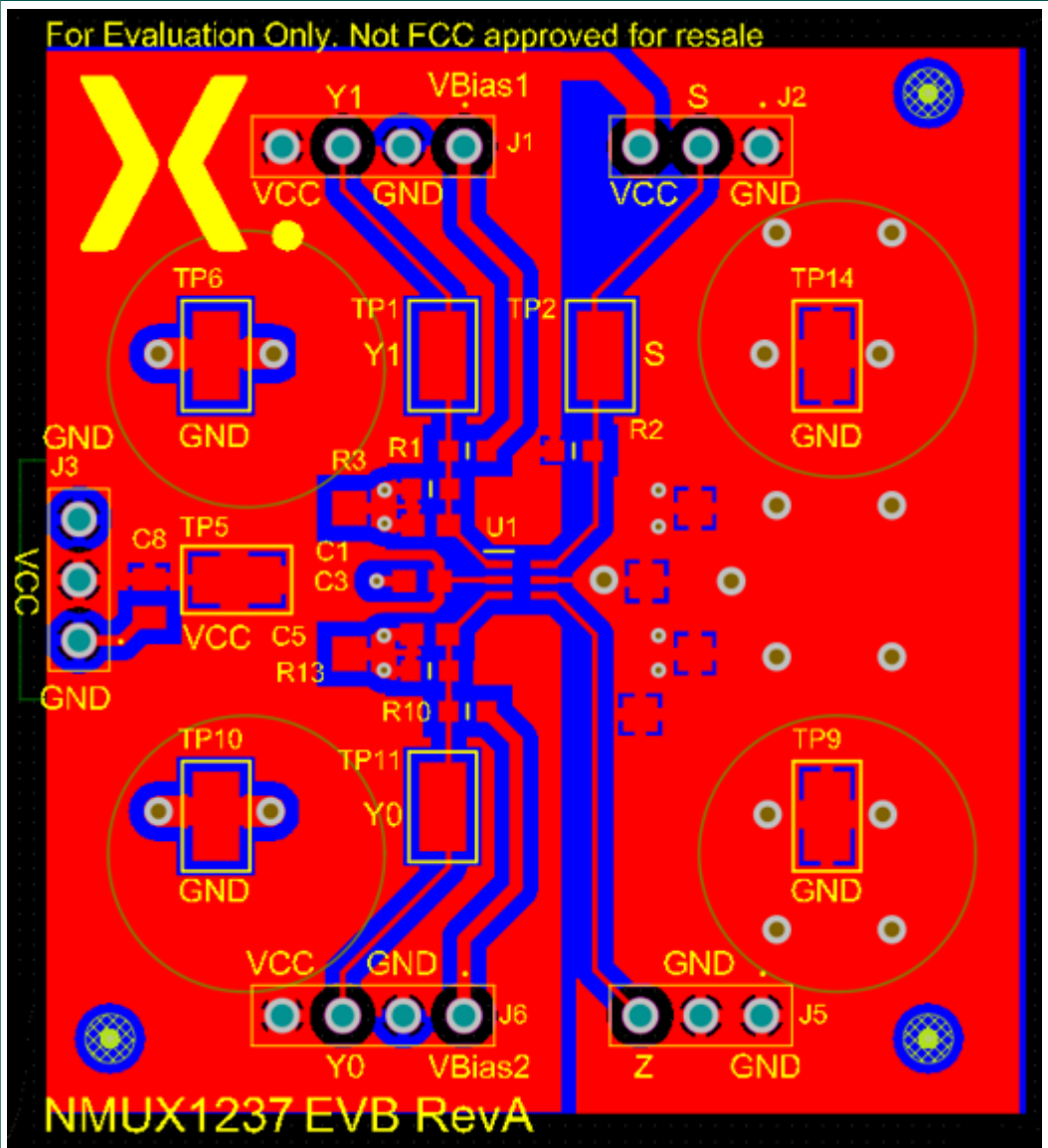


Fig. 4. Printed Circuit Board (PCB) layout top side

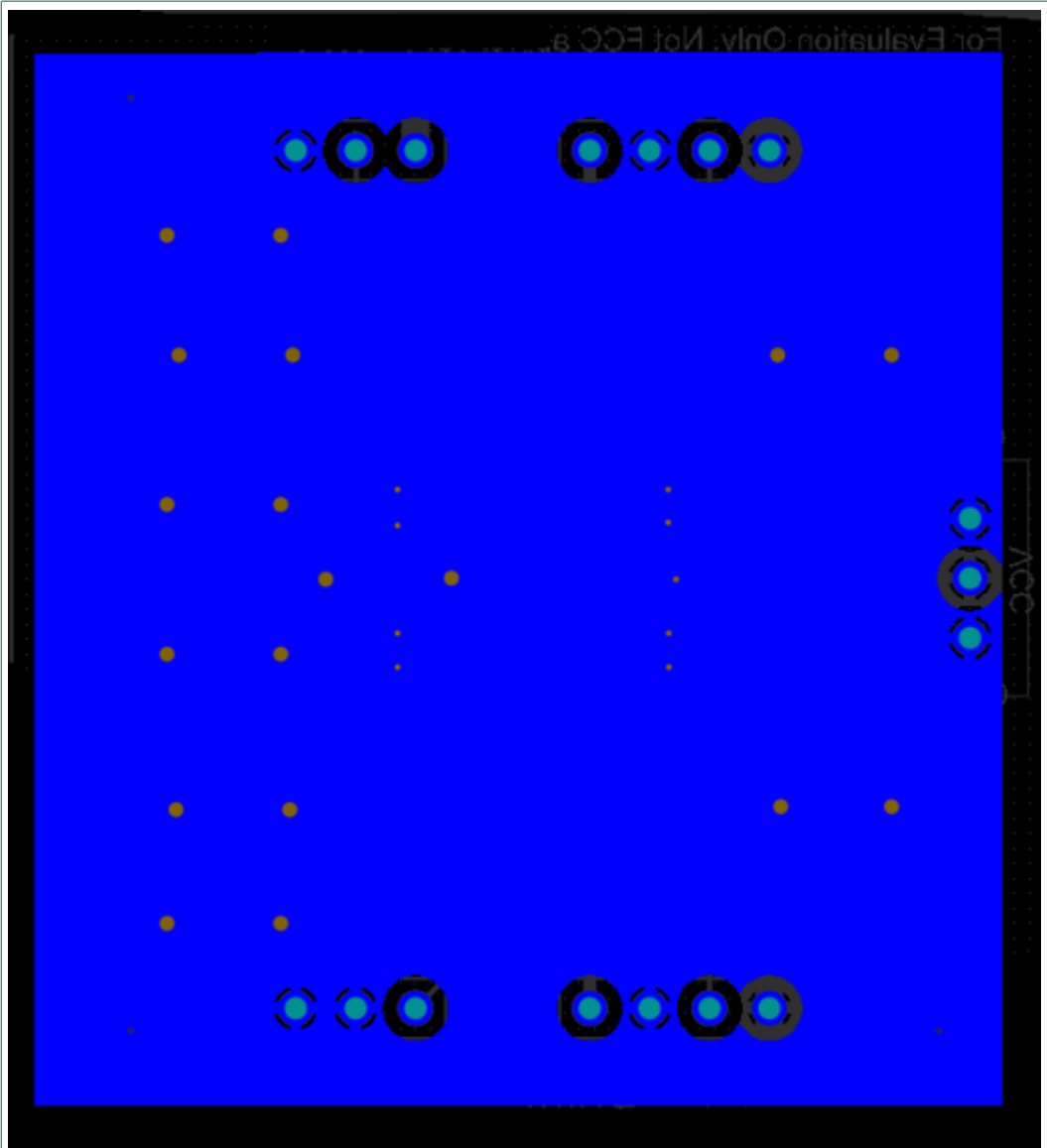


Fig. 5. Printed Circuit Board (PCB) layout back side

6. Bill of material

Table 3. Bill of Material (BOM)

Part number	Designator	Quantity
CC0603KRX7R7BB104	C3	1
C0805C105K5RAC7800	C8	1
FID	FID1, FID2, FID3	3
SJ-5303 (CLEAR)	H1, H2, H3, H4	4
TSW-104-07-T-S	J1, J6	2
TSW-103-07-T-S	J2, J3, J5	3
5019	TP1, TP2, TP5, TP6, TP9, TP10, TP11, TP14	8
NMUX1237GW	U1	1

7. Revision history

Table 4. Revision history

Revision number	Date	Description
UM90037 v.1	20240718	Initial version

8. Legal information

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Date of release: 18 July 2024