



AN1470 APPLICATION NOTE

Changing from the M24256-A to the M24256-B In Your Application

This document is written for users of the M24256-A and M24256-AW. These devices are now designated as “Not for New Design”, and will eventually be withdrawn from production. For the vast majority of applications, the M24256-B and M24256-BW are direct replacements and can be treated as pin compatible, and functionally equivalent.

Table 1. Table of Direct or Indirect Replacements

Old Device	V _{CC(max)}	Replacement Device	Package
M24256-A BN		M24256-B BN	PDIP8
M24256-A W BN		M24256-B W BN	
	< 3.6V	M24256-B W BN or M24256-B V BN	
M24256-A MN		M24256-B MN	SO8 (150mil)
M24256-A W MN		M24256-B W MN	
	< 3.6V	M24256-B W MN or M24256-B V MN	
M24256-A MW		M24256-B MW	SO8 (200mil)
M24256-A W MW		M24256-B W MW	
	< 3.6V	M24256-B W MW or M24256-B V MW	
M24256-A DL		M24256-B DL	TSSOP14
M24256-A W DL		M24256-B W DL	
	< 3.6V	M24256-B W DL or M24256-B V DL	

WHAT ARE THE DIFFERENCES?

The difference between the A and B versions of the M24256 is the E2 input.

- the M24256-B and M24256-BW have three chip enable lines (E0, E1, E2)
- the M24256-A and M24256-AW have two chip enable lines (E0, E1).

On the M24256-B and M24256-BW, the E2 signal appears:

- on pin 3, for PDIP8 and SO8 packages, and
- on pin 6, for the TSSOP14 package.

On the M24256-A and M24256-AW, these pins are specified as “Not Connected”.

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The user might, therefore, have adopted any one of the following options the pin (NC of the old device, E2 of the replacement):

1. it might have been left unconnected (without any connection on the PCB)
2. it might be tied to V_{SS} (ground)
3. it might be tied to V_{CC} (supply voltage)
4. it might be tied to some other level
5. it might be tied to a logic signal that the M24256-A ignores

The first two are the most likely options to have been adopted by the user. For these, the M24256-B and M24256-BW are direct replacements for the M24256-A and M24256-AW (respectively). The third option is less likely, and requires a change in the user's software when the replacement is made. The last two are the least likely options to have been adopted by the user, and are somewhat more problematic.

OPTIONS 1 AND 2: M24256-B AND M24256-BW ARE DIRECT REPLACEMENTS FOR THE M24256-A AND M24256-AW

As specified, in their respective data sheets, both versions A and B of the M24256 device have an internal pull-down resistor on each chip enable input. *Therefore, regardless of whether E2 of the replacement device is left unconnected in the application, or is explicitly connected to V_{SS} , it is read as 0.* (However, the case of the unconnected E2 pin only applies if it is not connected to a PCB track that can serve as an antenna, and pick up signals parasitically).

As specified in the data sheet for the M24256-A and M24256-AW, the b3 bit of the Device Select Code must be set to zero. When this software is run, unchanged, on the M24256-B and M24256-BW, it is interpreted as a "chip address" in which E2 is 0.

The replacement device automatically has the same "chip address" as the user's software was already setting for the old device.

OPTION 3: M24256-B AND M24256-BW DOES NOT DIRECTLY REPLACE THE M24256-A AND M24256-AW

If the NC pin of the old device, and hence the E2 pin of its replacement, has been tied to V_{CC} (supply voltage), a change needs to be made to the hardware *or* the software. So that the user's software specifies the same "chip address" as that now being interpreted by the replacement device, either the hardware needs to be modified so that E2 is left floating or pulled to V_{SS} , or the software needs to be modified so that the Device Select Code has its b3 bit set to 1.

OPTIONS 4 AND 5: M24256-B AND M24256-BW DOES NOT READILY REPLACE THE M24256-A AND M24256-AW

If the NC pin of the old device is being driven to some other voltage level, or is carrying a logic signal that the M24256-A ignores, a change needs to be made to the hardware. The hardware needs to be modified so that E2 is left unconnected to the PCB, or pulled to V_{SS} .

In case of any problems, or questions, users should contact their nearest ST sales office, or email "apps.eeprom@st.com"

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