

UT32M0R500 Board Design Recommendations

PRODUCT NAME	MANUFACTURER PART NUMBER	SMD #	DEVICE TYPE
Arm Cortex M0+	UT32M0R500	5962-17212	01, 02

Table 1: Cross Reference of Applicable Products

1.0 Introduction

This document provides board design recommendations for the UT32M0R500 Arm® M0+ Microcontroller. The UT32M0R500 is a mixed signal microcontroller, meaning it contains both digital and analog functionality. The recommendations in this document are specific to the UT32M0R500, and users should still work with experienced board designers to incorporate these recommendations into the rest of their design.

2.0 Power and Ground Planes

The UT32M0R500 requires 3.3V for both the digital and analog supplies, making it tempting for users to combine the power delivery into a single power rail and ground plane. However, CAES recommends users provide separate power rails and ground planes for the UT32M0R500's digital and analog supplies (VDD/VSS and VDDA/VSSA). This will ensure the noise from the digital domain caused by high frequency switching will not impact the performance of the analog domain. To ensure there isn't a difference between the voltage potential of the analog and digital grounds, place a ferrite bead or similar current-limiting component between the two grounds.

3.0 Decoupling

Decoupling capacitors between the power and ground pins of a component ensure the supply voltage is kept steady by providing a localized charge source. Place multiple surface-mount decoupling capacitors in a variety of values in parallel directly on the other side of the board from the UT32M0R500. The shortest possible distance is crucial to reduce the size of the current loop created.

4.0 Referencing the UT32M0R500 Evaluation Board

The UT32M0R500 evaluation board can be used as an initial reference for power and ground planes, and for decoupling capacitor values. However, as previously pointed out, this information is specific to the UT32M0R500, and there may need to be adjustments depending on the rest of the board being designed. The evaluation board schematics can be found on the CAES website in the UT32M0R500-EVB Users Guide document:

<https://caes.com/sites/default/files/documents/App-Note-UT32M0R500-EVB-Users-Guide.pdf>

5.0 Conclusion

The recommendations in this document are intended to provide customers with information on the preferred way to power and ground the UT32M0R500. There is a lot of research and differing opinions on board and system level grounding philosophies, and there isn't any one right answer on how to approach every design. Users should reference this recommendation to achieve a better understanding of how to design their overall board and system.

UT32M0R500 Creating Projects in the Keil IDE

Revision History

Date	Revision	Author	Change Description
05/09/2022	1.0.0	OW	Initial Release

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