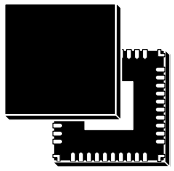
ST64UWB-A500

Data brief

Next-generation automotive ultra-wideband ranging and radar IC with narrow band radio assist



HWQFN40 (6 x 6 mm)

Product link
ST64UWB-A500

Features

Automotive compliance

- AEC-Q100 grade 2 qualified
- Ambient -40°C to +115°C
- Junction max.: +125°C
- ISO21434 (Automotive Cybersecurity Level 2)
- ISO26262 (ASIL-A)
- 15-year mission profile

Includes ST state-of-the-art patented technology

Core

- Arm® 32-bit Cortex®-M85 CPU with DP-FPU, MVE, ETM
- Frequency up to 256 MHz

GPIOs

- Out of the 20 available GPIOs, a subset is configurable for use as communication-interface pins

Security

- Arm® TrustZone® with Armv8.1-M mainline security extension
- oArm® PSA and SESIP L3 certifications

Ultra-wideband radio (UWB)

- Supported standards for UWB radio:
  - IEEE 802.15.4z-2020
  - IEEE802.15.4ab
  - CCC, ICCE
- Antenna ports: 2 × transmit and receive ports
- Supported channels: 5, 6, 8-12 (6489.6 MHz to 8985.6 MHz)
- Modulation: BPRF, HPRF

Narrow-band assisted radio (NBA)

- Supported standard for NBA radio
- 1 × antenna Tx/Rx port
- UNII-3 / UNII-5 (5.7-6.4 GHz)

Communication interfaces

- 2 × SPI, 2 × I2C, FDCAN, USART, LPUART

Digital temperature sensor

Applications

- Secure UWB localization
  - SS-TWR, DS-TWR, and AoA, PDoA
  - CCC-Digital key phase 3
  - Car key inside/outside detection
- Radar sensing:
  - Multimoving target detection
  - Distance and angle, kick sensor
  - Child presence detection (CPD)

Package

- HWQFN40 with wettable flank (6 × 6 mm, 0.5 mm pitch)
- ECOPACK® 2 compliant

1 Introduction

This document provides information about the ST64UWB-A500, an automotive-grade wireless microcontroller for ultra-wideband ranging and radar applications.

For information on the embedded Arm core, refer to the Cortex®-M85 technical reference manual, available from the www.arm.com website.

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Arm and TrustZone are registered trademarks of Arm Limited (or its subsidiaries or affiliates) in the US and/or elsewhere.

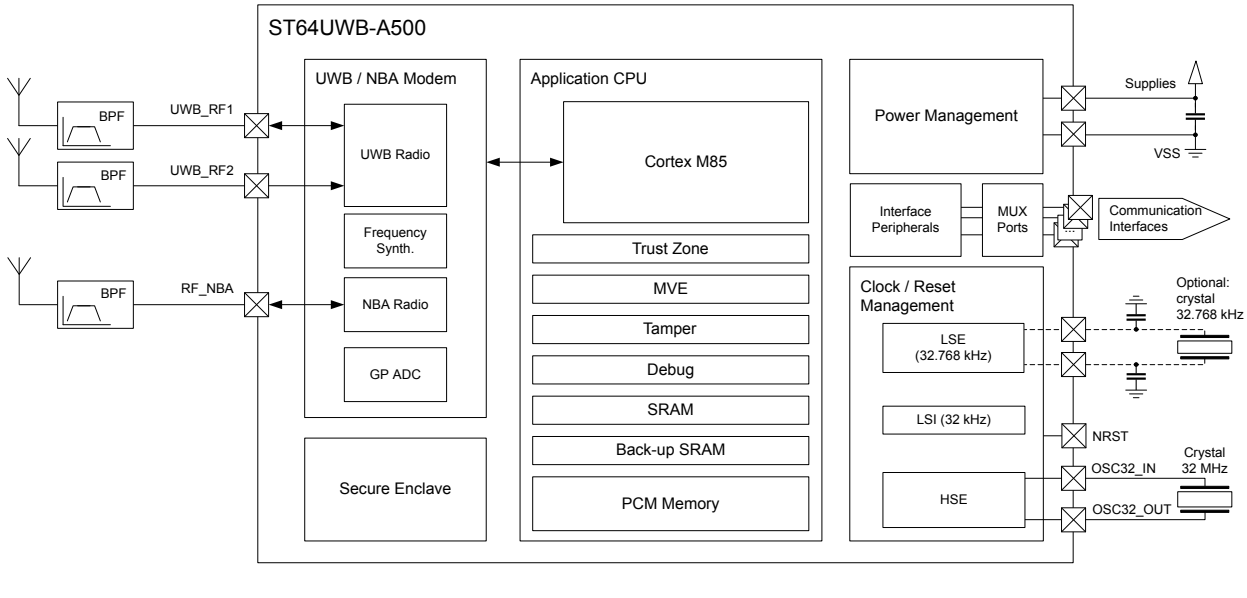
2 Description

The ST64UWB-A500 is the first monolithic next-generation ultra-wideband solution from STMicroelectronics designed for automotive applications. The device complies with IEEE 802.15.4ab and uses narrowband-assisted multi-millisecond ranging technology. Manufactured with 18 nm FDSOI technology, it provides a significantly improved link budget and enables robust, secure ranging, even in non-line-of-sight conditions.

The ST64UWB-A500 combines advanced ultra-wideband ranging, extending the range by eight times, with high-performance ultra-wideband radar capabilities. This delivers best-in-class spatial resolution for automotive use cases such as Car Connectivity Consortium® Digital Key, child presence detection, and gesture-based kick sensors.

The device is powered by an Arm® Cortex®-M85 core operating at up to 256 MHz. It integrates PCM and SRAM, offers comprehensive automotive connectivity including FDCAN, and features advanced security compliant with SESIP Level 3, ISO 26262 (ASIL A), and AEC-Q100 Grade 2. The ST64UWB-A500 is a highly integrated, single-chip platform for secure, reliable, and cost-efficient ultra-wideband automotive applications.

Figure 1. ST64UWB-A500 block diagram



DT60028V1

3 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

3.1 Device marking

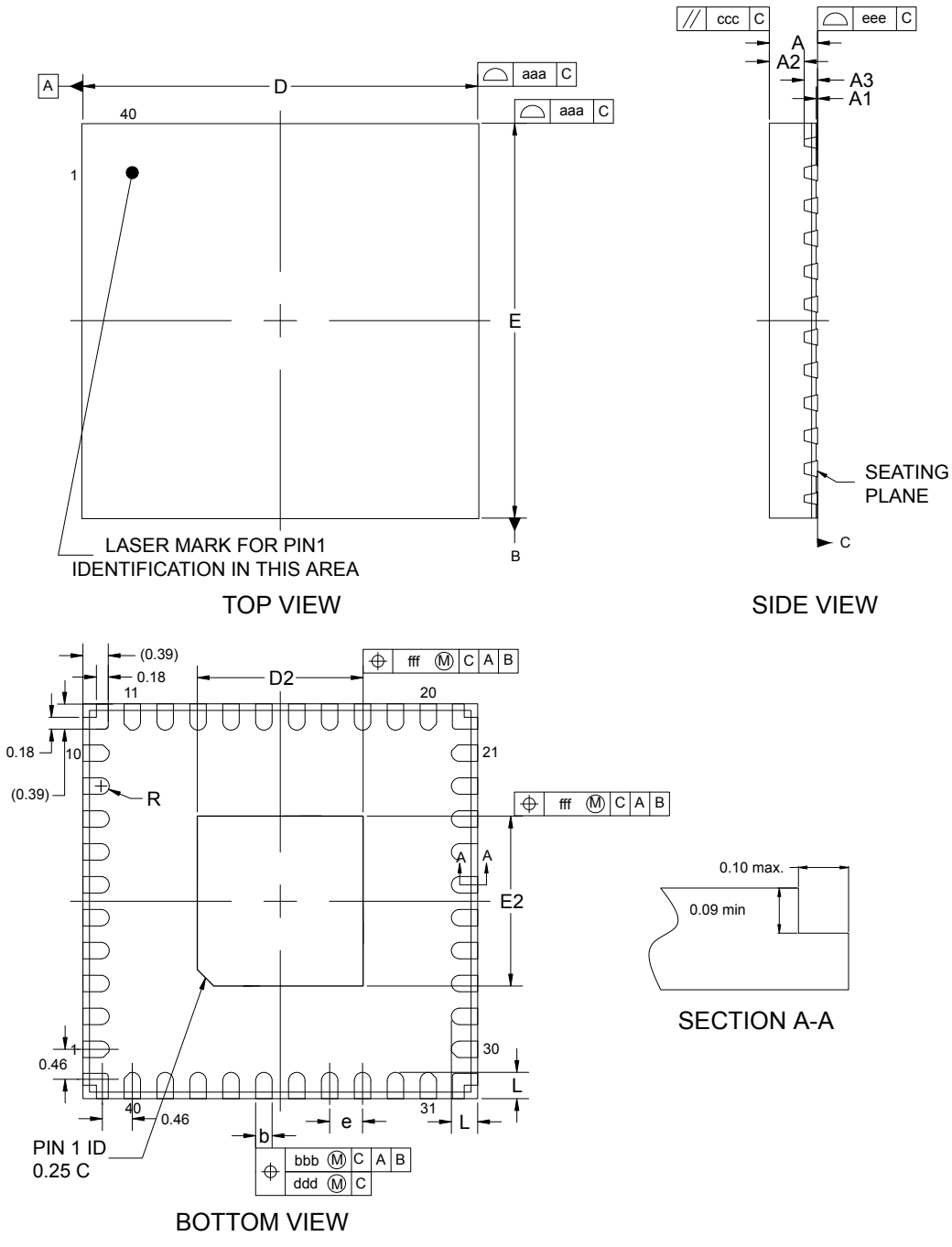
Parts marked as "ES", "E" or accompanied by an engineering sample notification letter, are not yet qualified and therefore not approved for use in production. ST is not responsible for any consequences resulting from such use.

In no event will ST be liable for the customer using any of these engineering samples in production. ST's Quality department must be contacted prior to any decision to use these engineering samples to run a qualification activity.

3.2 HWQFN40 package information

This HWQFN is a 40-pin, 6 x 6 mm, 0.5 mm pitch, thermally enhanced very thin profile quad flat no lead package.

Figure 2. HWQFN40 - Outline



1. *Drawing is not to scale.*
2. *Dimensioning and tolerances conform to ASME Y14.5M-1994.*
3. *The pin number 1 identifier must be placed on the top surface of the package using an indentation mark or another feature of the package body.*

Table 1. HWQFN40 - Mechanical data

Symbol	Millimeters			Inches[1]		
	Min	Typ	Max	Min	Typ	Max
A[2]	-	-	0.80	-	-	0.0315
A1	0.00	-	0.05	0.0000	-	0.0020
A2	-	0.53	0.58	-	0.0209	0.0228
A3		0.20 REF			0.0079 REF	
b	0.18	0.25	0.30	0.0071	0.0098	0.0118
D		6 BSC[3]			0.2362 BSC	
D2	2.42	2.52	2.62	0.0953	0.0992	0.1031
E		6 BSC			0.2362 BSC	
E2	2.48	2.58	2.68	0.0976	0.1016	0.1055
L	0.30	0.40	0.50	0.0118	0.0157	0.0197
e		0.50 BSC			0.0197 BSC	
R	0.09	-	-	0.0035	-	-

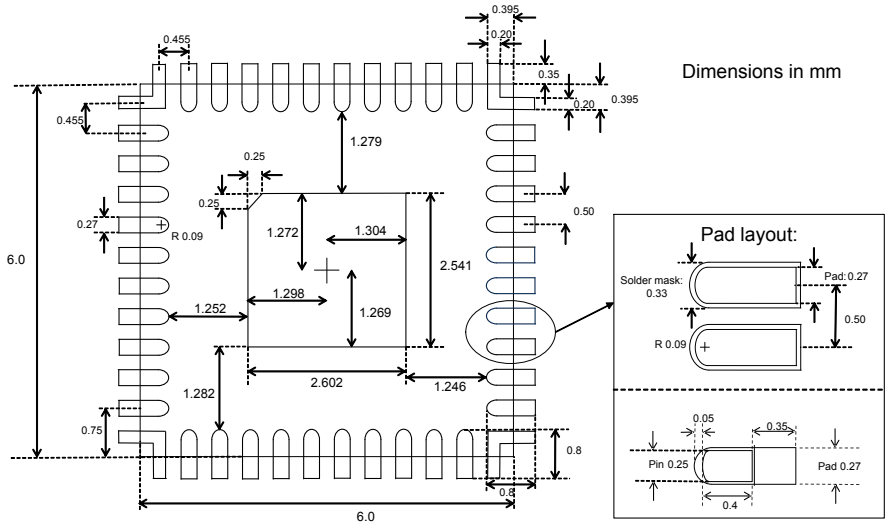
1. *Values in inches are converted from mm and rounded to four decimal digits.*
2. *Very very thin profile: 0.65 < A ≤ 0.80 mm.*
3. *BSC stands for BASIC dimensions. It corresponds to the nominal value and has no tolerance.*

Table 2. HWQFN40 - Tolerance of form and position

Symbol	Millimeters			Inches[1]		
	Min	Typ	Max	Min	Typ	Max
aaa		0.10			0.0039	
bbb		0.10			0.0039	
ccc		0.10			0.0039	
ddd		0.05			0.0020	
eee		0.08			0.0031	
fff		0.10			0.0039	

1. *Values in inches are converted from mm and rounded to four decimal digits.*

Figure 3. **HWQFN40 - Footprint example**



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Revision history

Table 3. **Document revision history**

Date	Revision	Changes
09-Mar-2026	1	Initial release.

Contents

List of figures

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