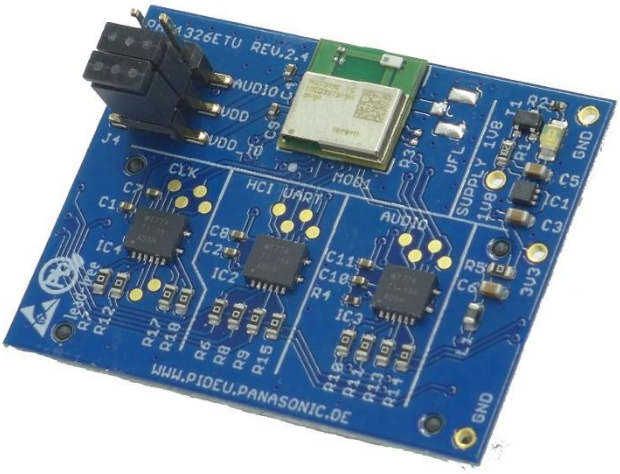
PAN1326C2

Bluetooth® Basic Data Rate and Low Energy Module

Design Guide

Rev. 1.0



Wireless Modules

Overview

Panasonic’s new PAN1326C2 is a Host Controlled Interface (HCI) Bluetooth® Radio Frequency (RF) module that brings Texas Instruments™ seventh generation Bluetooth core integrated circuit, the CC2564C, to an easy to use module format. The PAN1326C2 is Bluetooth 4.2 compliant and it offers best-in-class RF performance with about twice the range of other Bluetooth Low Energy (LE) solutions. Panasonic’s tiny footprint technology has produced a module of only 85.5 mm^2. The module is designed to accommodate PCBs pad pitch of 1.3 mm and as few as two layers for easy implementation and manufacturing. The module has been designed to be 100 percent pin-compatible with previous generations of Texas Instruments based Bluetooth HCI modules.

Bluetooth

- Scatternet and piconets simultaneously
- Synchronous Connection Oriented (SCO) links on the same piconet
- Support for All Voice Air-Coding – Continuously Variable Slope Delta (CVSD), A-law, µ-law, modified Subband Coding (mSBC), and transparent (uncoded)
- Assisted mode for HFP 1.6 Wideband Speech (WBS) profile or A2DP profile to reduce host processing and power
- Support of multiple Bluetooth profiles with enhanced QoS
- Multiple sniff instances tightly coupled to achieve minimum power consumption
- Independent buffering for LE allows large numbers of multiple connections without affecting BR or EDR performance
- Built-in coexistence and prioritization handling for BR, EDR, and LE
- Capabilities of link layer topology Scatternet (can act concurrently as peripheral and central)
- Network support for up to 10 devices
- Time line optimization algorithms to achieve maximum channel utilization

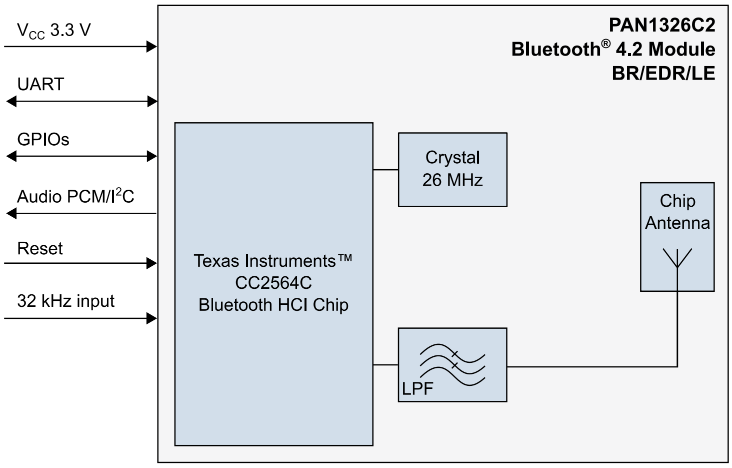
Features

- Bluetooth 4.2 compliant up to the HCI layer
- Best-in-class Bluetooth RF performance (Tx, Rx sensitivity, blocking)
- Dimensions: 9 mm x 9.5 mm x 1.8 mm
- Based upon Texas Instruments CC2564C
- Interfaces: UART, GPIO, PCM

Characteristics

- Bluetooth 4.2
- Receiver sensitivity: -90 dBm
- Output power: 8 dBm
- Power supply: 1.7 V to 4.8 V
- Power consumption: Tx 40 mA
- Power consumption: Rx 20 mA
- Operating temperature range: -40 °C to 85 °C

Block Diagram



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Engineering Samples (ES)

If Engineering Samples are delivered to the customer, these samples have the status “Engineering Samples”. This means that the design of this product is not yet concluded. Engineering Samples may be partially or fully functional, and they may differ from the published Product Specification.

Engineering Samples are not qualified and they are not to be used for reliability testing or series production.

Disclaimer

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- Deviation or lapse in function of the Engineering Sample,
- Improper use of the Engineering Sample.

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Table of Contents

1 About This Document

1.1 Purpose and Audience

This Design Guide applies to the Bluetooth development platform PAN1326C2 Experimenter Kit. The intention is to enable our customers to easily and fast integrate our module PAN1326C2 in their product. This guide describes the hardware and gives useful hints.

1.2 Revision History

Revision	Date	Modifications/Remarks
1.0	2019-11-08	First version

1.3 Use of Symbols

Symbol	Description
ⓘ	**Note** Indicates important information for the proper use of the product. Non-observance can lead to errors.
⚠	**Attention** Indicates important notes that, if not observed, can put the product's functionality at risk.
✎	**Tip** Indicates useful information designed to facilitate working with the Module.
⇨ [chapter number] [chapter title]	**Cross reference** Indicates cross references within the document. **Example:** Description of the symbols used in this document ⇨ 1.3 Use of Symbols.

1.4 Related Documents

Please refer to the Panasonic website for related documents ⇨ 6.2.2 Product Information.

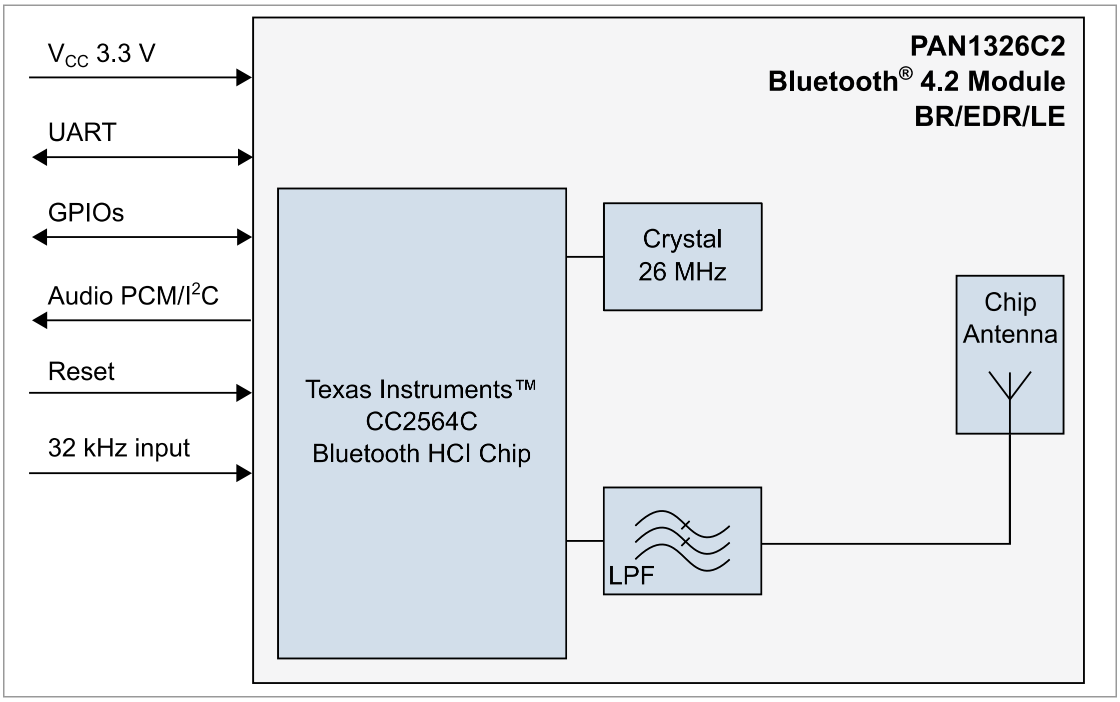
2 Overview

Panasonic’s new PAN1326C2 is a Host Controlled Interface (HCI) Bluetooth RF module that brings Texas Instrument’s seventh generation Bluetooth core integrated circuit, the CC2564, to an easy to use module format. The PAN1326C2 is Bluetooth 4.2 compliant and it offers best in class RF performance with about twice the range of other Bluetooth LE solutions. Panasonic’s tiny footprint technology has produced a module of only 85.5 mm². The module is designed to accommodate PCBs pad pitch of 1.3 mm and as few as two layers for easy implementation and manufacturing. The module has been designed to be 100 percent pin-compatible with previous generations of Texas Instruments based Bluetooth HCI modules.

Please refer to the Panasonic website for related documents ⇨ 6.2.2 Product Information.

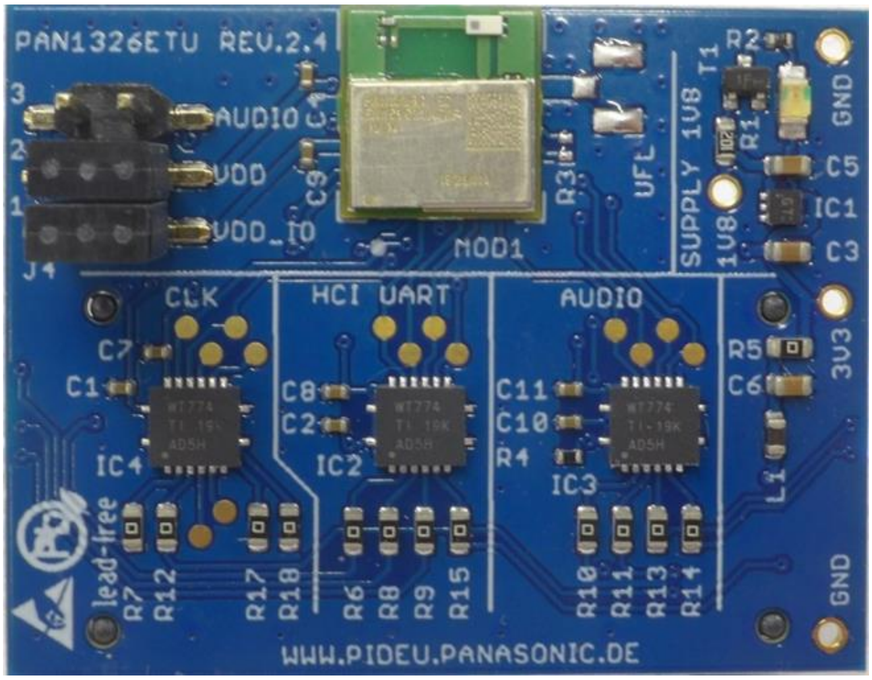
Further information on the variants and versions ⇨ 6.1 Ordering Information.

Block Diagram

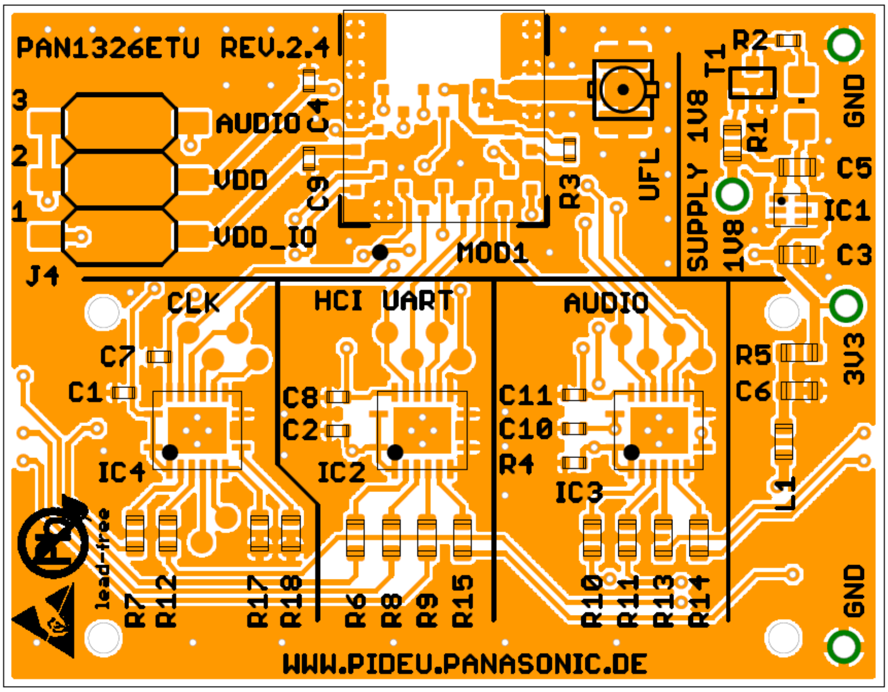


3 Reference Design

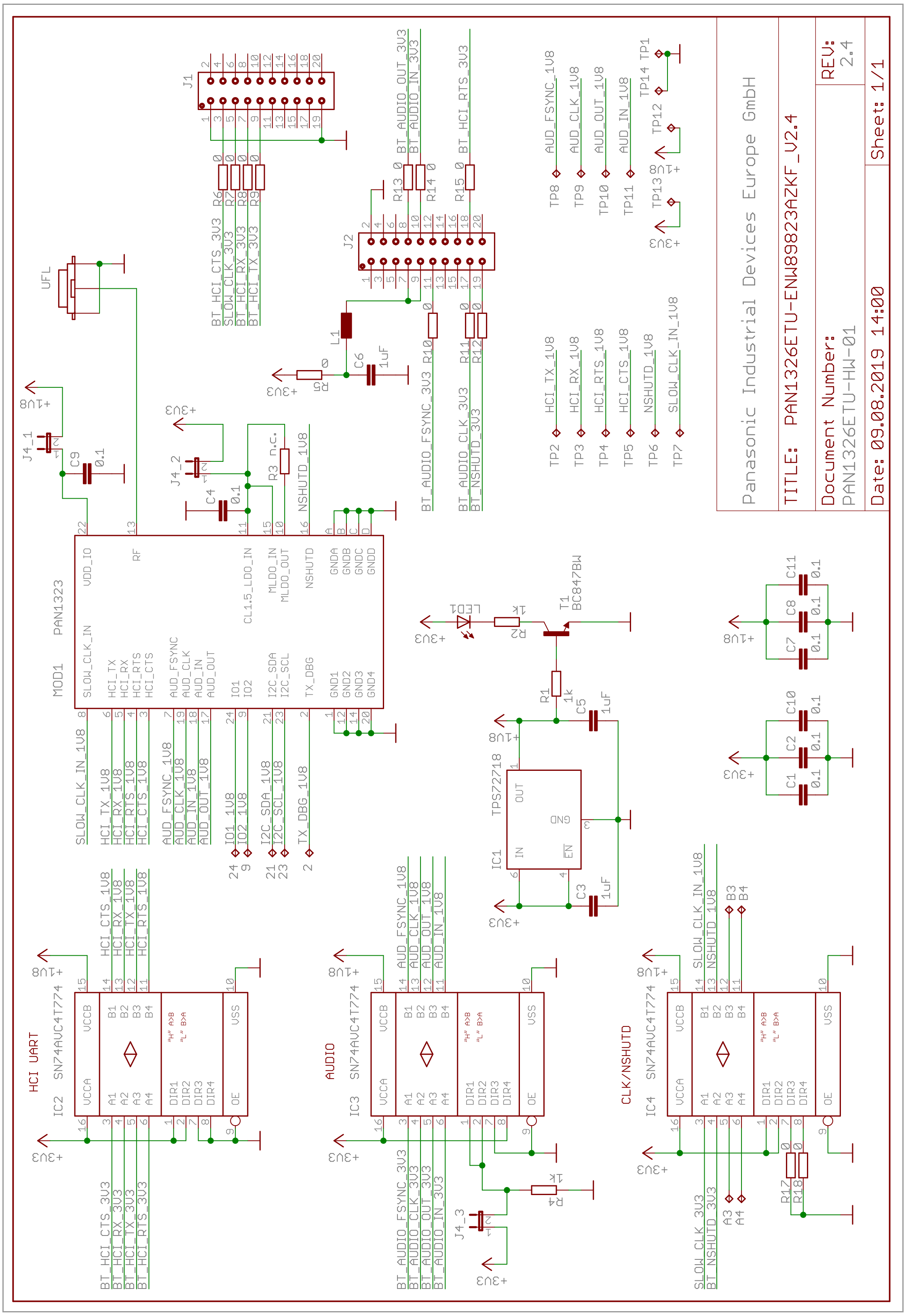
3.1 Breakout Board



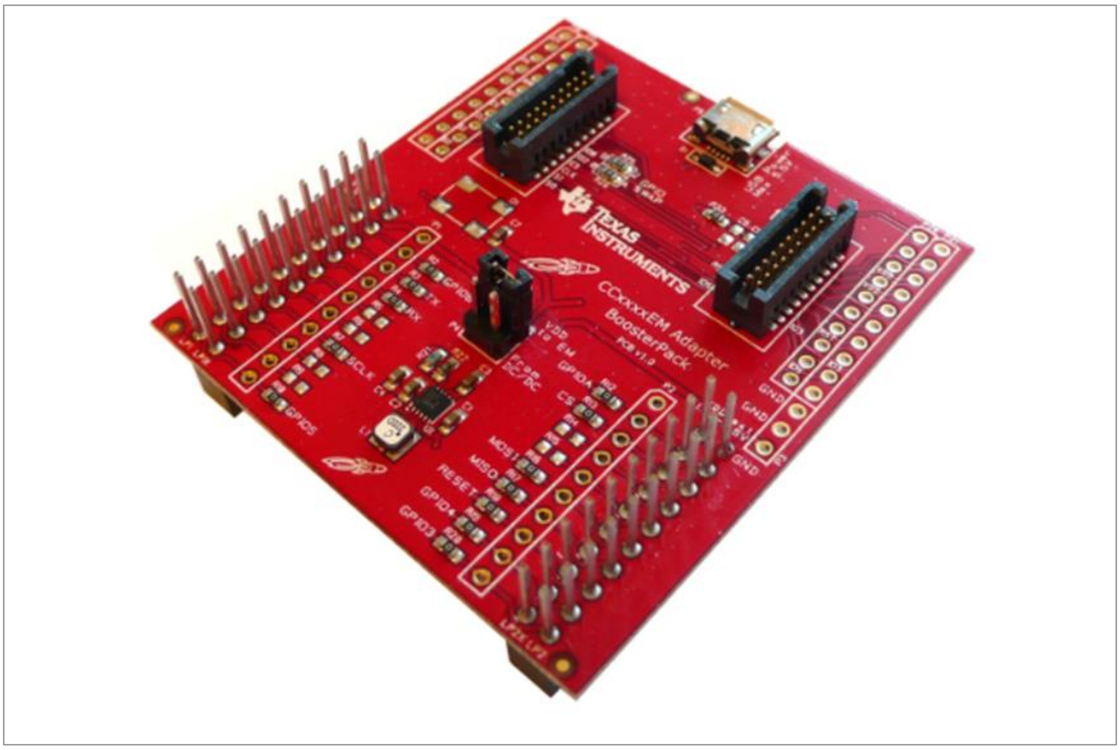
3.1.1 Component Placement



3.1.2 Schematic

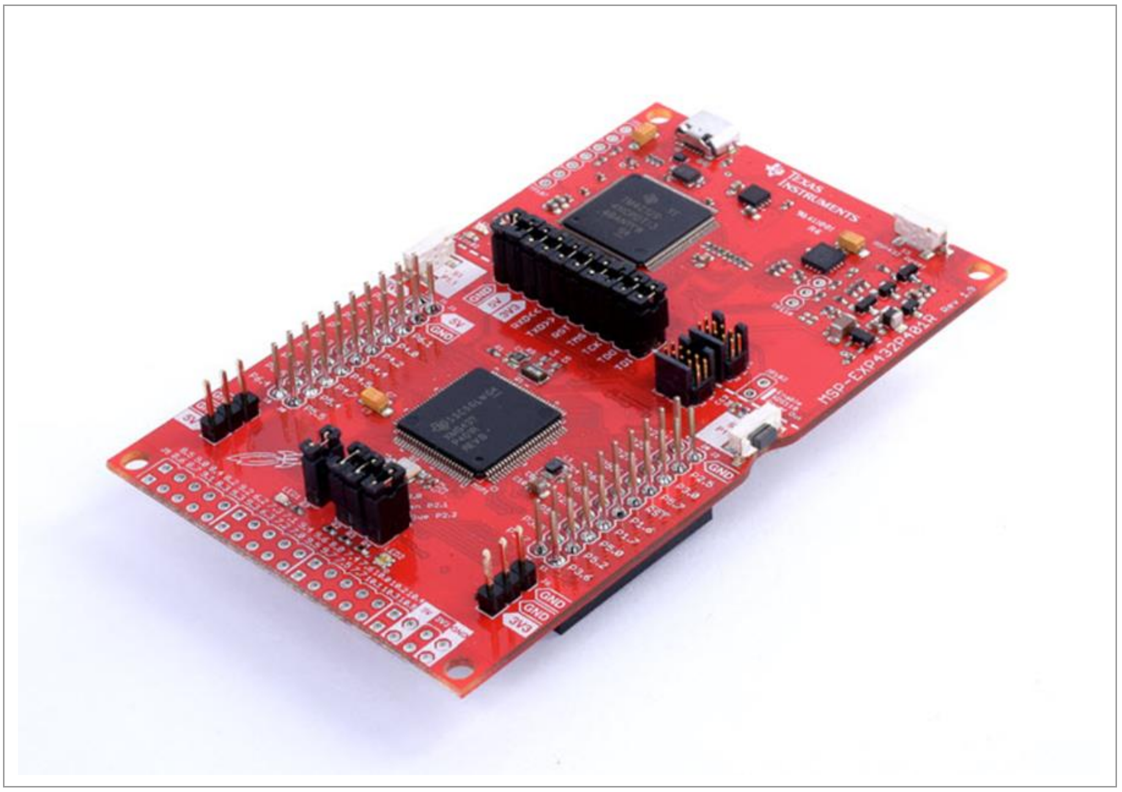


3.2 EM Adapter BoosterPack



If the adapter board is purchased directly via Texas Instruments or a related distributor, the crystal oscillator next to C7 is not equipped. Please be aware, that in this case the 32 kHz slow clock is missing and has to solder on the board.

3.3 MSP432 Launchpad



For detailed information about the installation and tools, please refer to the Texas Instruments website http://www.ti.com/.

4 Placement Recommendations

⚠ **Antenna "Keep-Out Area"**

Do not place any ground plane under the red marked restricted antenna area in any layer! This would be affecting the performance of the chip antenna in a critical manner.

⚠ **Impact of Placement on the Antenna Radiation Pattern**

The placement of the module, surrounding material, and customer components has an impact on the radiation pattern of the antenna.

It is recommended to verify the perfect position of the module in the target application before fixing the design.

The following conditions must be met:

- ✓ Keep this product away from heat. Heat is the major cause of decreasing the life of these products.
- ✓ Keep this product away from other high frequency circuits.

To download the design files, please refer to the download area on the product website
⇨ 6.2.2 Product Information.

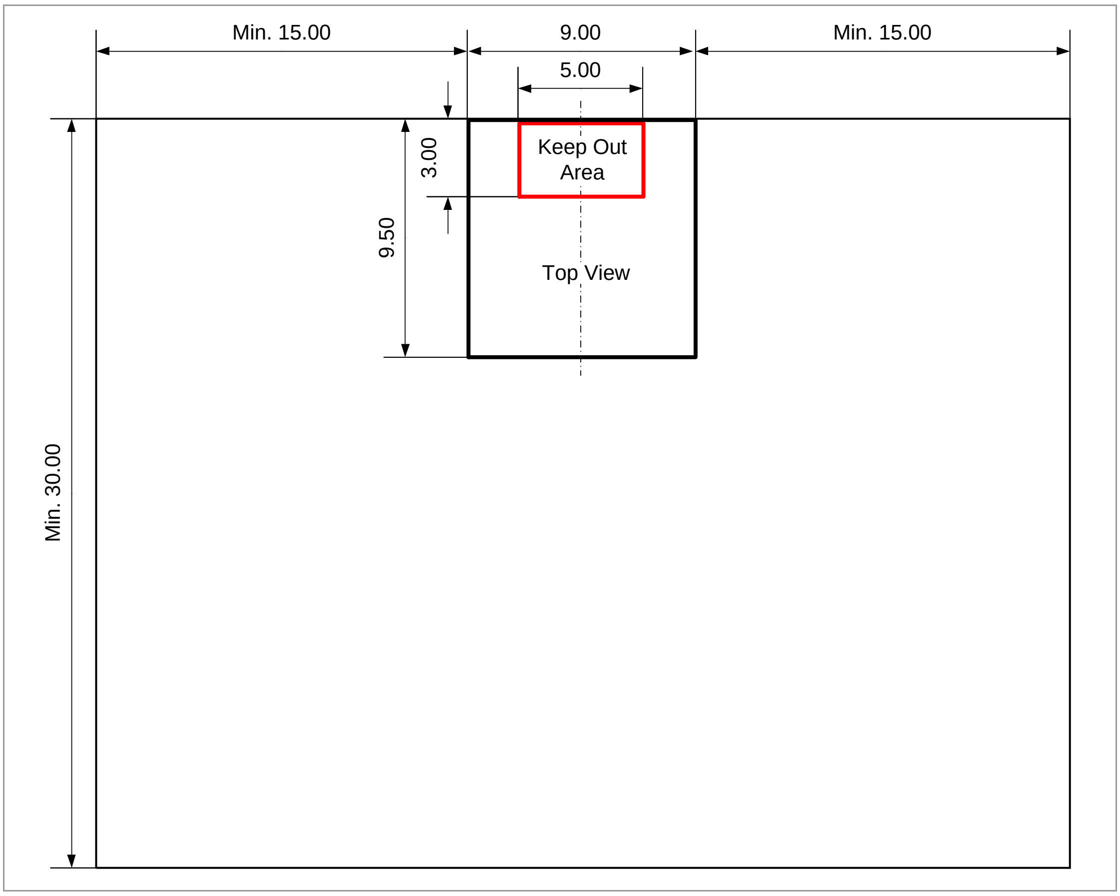
All dimensions are in millimeters.

Use a ground plane in the area surrounding the module wherever possible.

It is recommended to place the module:

- In the center (horizontal) of mother PCB.
- At the edge (horizontal) of mother PCB.

Placement



5 Life Support Policy

This Panasonic Industrial Devices Europe GmbH product is not designed for use in life support appliances, devices, or systems where malfunction can reasonably be expected to result in a significant personal injury to the user, or as a critical component in any life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Panasonic customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Panasonic Industrial Devices Europe GmbH for any damages resulting.

6 Appendix

6.1 Ordering Information

Variants and Versions

Order Number	Brand Name	Description	MOQ[1]
ENW89823AYKF	Experimenter Kit	1x PAN1326C2 Breakout Board 1x Texas Instruments MSP430 Launchpad 1x Texas Instruments Boost/CCEMAdapter	1
ENW89823AZKF	1326C2 Breakout Board	1x PAN1326C2 Breakout Board	1

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[1] Abbreviation for Minimum Order Quantity (MOQ). The default MOQ for mass production is 1 500 pieces, fewer only on customer demand. Samples for evaluation can be delivered at any quantity via the distribution channels.

6.2 Contact Details

6.2.1 Contact Us

Please contact your local Panasonic Sales office for details on additional product options and services:

For Panasonic Sales assistance in the **EU**, visit
https://eu.industrial.panasonic.com/about-us/contact-us
Email: wireless@eu.panasonic.com

For Panasonic Sales assistance in **North America**, visit the Panasonic website
“Sales & Support” to find assistance near you at
https://na.industrial.panasonic.com/distributors

Please visit the **Panasonic Wireless Technical Forum** to submit a question at
https://forum.na.industrial.panasonic.com

6.2.2 Product Information

Please refer to the Panasonic Wireless Connectivity website for further information on our products and related documents:

For complete Panasonic product details in the **EU**, visit
http://pideu.panasonic.de/products/wireless-modules.html

For complete Panasonic product details in **North America**, visit
http://www.panasonic.com/rfmodules