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# Anaren Integrated Radio (AIR)

Low-power RF modules, firmware & development tools that make it easy to 'go wireless'

## BoosterPack Series

The A2541R24A-ADB1 B-SMART BoosterPack kit is a development tool designed for use with the TI MSP430™ Value Line, TIVA-C, C2000 and other LaunchPad kits. The kit eases development of products that wirelessly communicate with devices incorporating *Bluetooth*® SMART technology per the *Bluetooth* 4.0 core specification\*. The BoosterPack features an A2541R24A20 AIR module (based on TI's CC2541 low-power SoC) and is pre-loaded with Em-Ware firmware from Emmoco (based on TI's BLE-Stack).



A2541R24A-ADB1

### Features

#### Kit:

- Includes one A2541R24A AIR Module BoosterPack, for connection to TI's MSP430, TIVA-C, C2000, and other LaunchPad development tools (not included)
- Each BoosterPack includes indicator LEDs, current monitoring circuitry, and provision for an on-board MSP430 Value Line microprocessor
- Includes B-SMART breakout cable for easy connection to a wide variety of processors

#### AIR Module:

- Incorporates TI's CC2541 SoC
- Tiny 11x19x2.5 mm footprint
- Pre-certified to FCC/IC and ETSI compliant
- Low power consumption

#### Firmware:

- Comes with Emmoco firmware (based on TI BLE Stack), designed for easy implementation of embedded-mobile-connectivity. Emmoco software and tools enable easy communication between an embedded device and *Bluetooth* SMART Ready phones and tablets
- Emmoco's Em-Builder tools and Schema concept generate code that makes sharing data between embedded and mobile devices easy

### Benefits

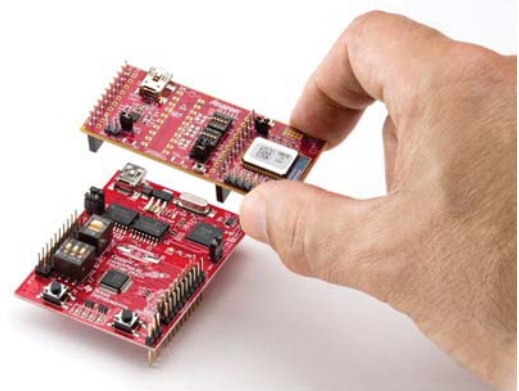
- Provides "out of the box" wireless connectivity for easier development of applications based on the *Bluetooth* SMART standard
- Includes Emmoco firmware solution (based on TI's BLE-Stack), which compresses time to market by greatly reducing the development time
- Provides an excellent learning/development tool for all levels of *Bluetooth* SMART expertise— as well as a clear, easy-to-understand migration path from development to production
- Part of the *AIR Support—for Bluetooth* SMART, a total solution from Anaren that includes development tools, firmware, applications support, and more

### Applications

Industrial controls and monitoring, remote controls, home/building automation, lighting systems, low power wireless sensor networks, and consumer electronics, sports monitoring, health & wellness, among many others



Applications are written in an easy-to-use schema format, and then pushed to a handheld device which interacts with the BoosterPack



The A2541R24A-ADB1 BoosterPack snaps onto the TILaunchPad (sold separately) or connects to other processors via the included cable.





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## Module family overview



### General:

- 2.4-GHz RF transceiver incorporating *Bluetooth* SMART technology per the *Bluetooth* 4.0 core specification
- Excellent receiver sensitivity and robustness to interference (-89/-94dBm typical in BLE LGM/HGM mode with <0.1% BER)
- Wide input voltage range (2.0V – 3.6V)
- Features TI TPS62730 step-down converter for optimal power usage
- Features 32.768kHz crystal for enabling ultra-low power sleep timer
- Choice of integral antenna or U.FL connector
- 100% RF tested in production
- Module weight approximately 0.7 grams

### Current Consumption: (Typ @ TC = 25°C, VDD = 3.0V)

- Active mode RX (CPU Idle): 14 mA
- Active mode TX (CPU Idle): 13 mA @0dBm, with 3 low power/sleep modes from 0.5uA to 270 uA

### Microcontroller:

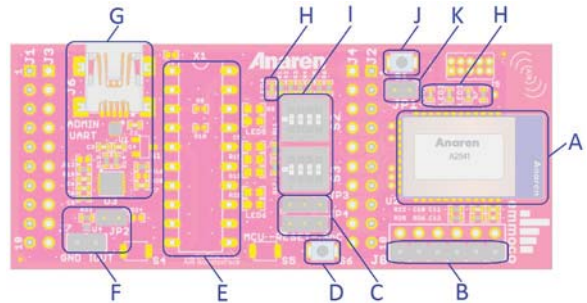
- High-performance and low-power 8051 Microcontroller core with code prefetch
- 256KB in-system programmable flash and 8KB RAM with retention in all power modes

### Firmware:

- Preloaded with Emmoco firmware featuring *Bluetooth* SMART technology, designed for easy implementation of embedded-mobile-connectivity

## Layout information

BoosterPack features shown below; see User's Manual for more information.



- |   |                                 |   |                          |
|---|---------------------------------|---|--------------------------|
| A | AIR Radio Module                | G | Administrative UART      |
| B | External MCU connection         | H | LEDs                     |
| C | Launchpad configuration jumpers | I | Control switches         |
| D | SoC reset switch                | J | Switch                   |
| E | MSP430 MCU provision            | K | Voltage regulator bypass |
| F | Current sensing                 |   |                          |

To view the entire family of AIR modules & development tools, please visit our website at:

<http://www.anaren.com/air>



**PLEASE NOTE:** Additional information on the Texas Instruments CC2541 can be found at <http://www.ti.com>

## Nomenclature

# A2541R24A-ADB1

①      ②      ③      ④      ⑤

- |   |   |
|---|---|
| A | (Anaren)  |
| 1 | Chip series (CC1101, CC2500, CC2530, CC2541)                                      |
| 2 | Function (R = radio only, E=Range Extender)                                       |
| 3 | Frequency band (x100MHz)  |
| 4 | Form factor (A = Internal Antenna)  |
| 5 | Module Type (EM1 = Eval Module, EZ4x = EZ-430 Module, LPx / A DBx = Booster Pack) |

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**IMPORTANT:** The A2541R24A-ADB1 BoosterPack is a tool to aid in the development and testing of wireless communication applications; it is not to be used in the actual production of wireless end-products or for resale as a wireless communications network.



The item described in this product brief is part of our total AIR Support solution. To learn more, visit our website or just ask us!

For more information see product User's Manual, available online.



# Anaren®

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