

DA14531 & MODULE SMARTBOND TINY™

LOWEST POWER, SMALLEST SIZE
BLUETOOTH® LOW ENERGY DEVICE



DA14531 SMARTBOND TINY™ – BLUETOOTH® LOW ENERGY

INTRODUCING THE BLUETOOTH LE DEVICES THAT WILL CONNECT THE NEXT BILLION IOT DEVICES

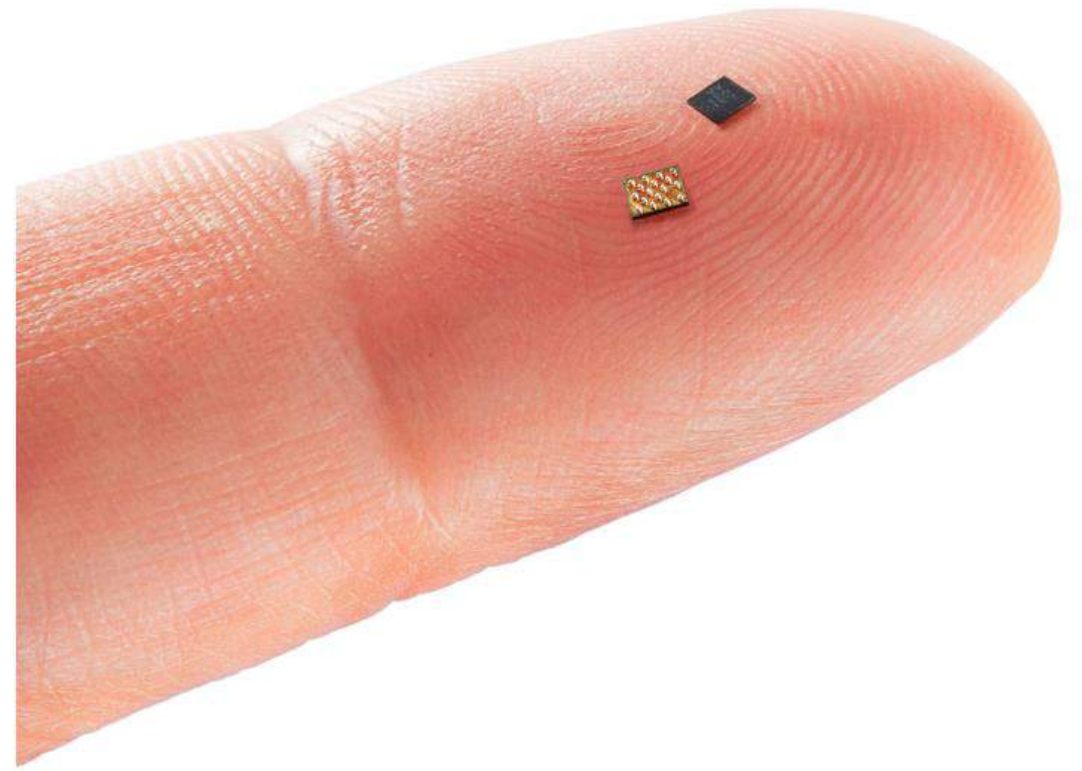
Designed to power the next billion IoT devices...

...By lowering the cost of adding Bluetooth low energy functionality to a system, in high volume, to sub \$0.50*

...Without compromising performance or size

- World leading low power
- Half the size of current solutions
- World leading performance
- Bluetooth 5.1 qualified

* Total system cost @10Mpcs+



WORLD LEADING PERFORMANCE

HOW DOES THE DA14531 NICKNAMED SMARTBOND TINY™ COMPARE TO THE KEY COMPETITOR

EEMBC

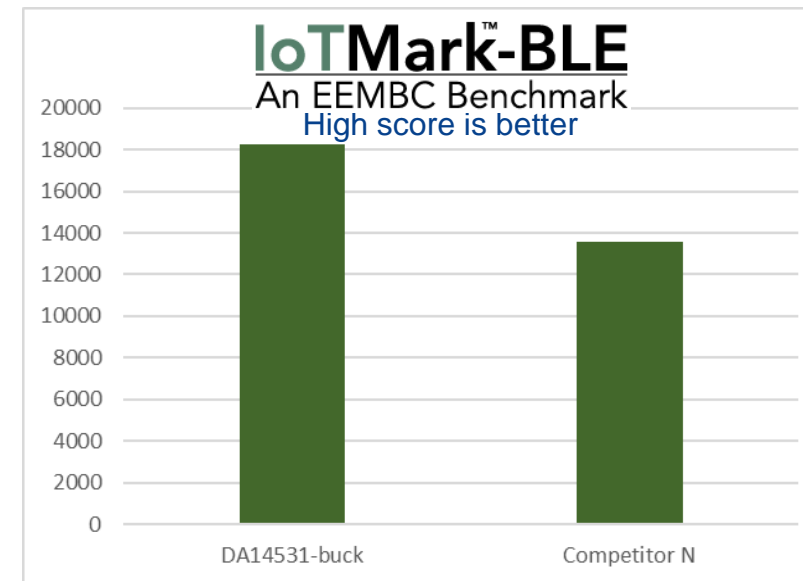
- The Embedded Microprocessor Benchmarking Consortium

IoTMark-BLE

- Most recent benchmark for connected IoT devices
- Represents a real world Bluetooth LE sensor model

DA14531 is 35% better in power efficiency

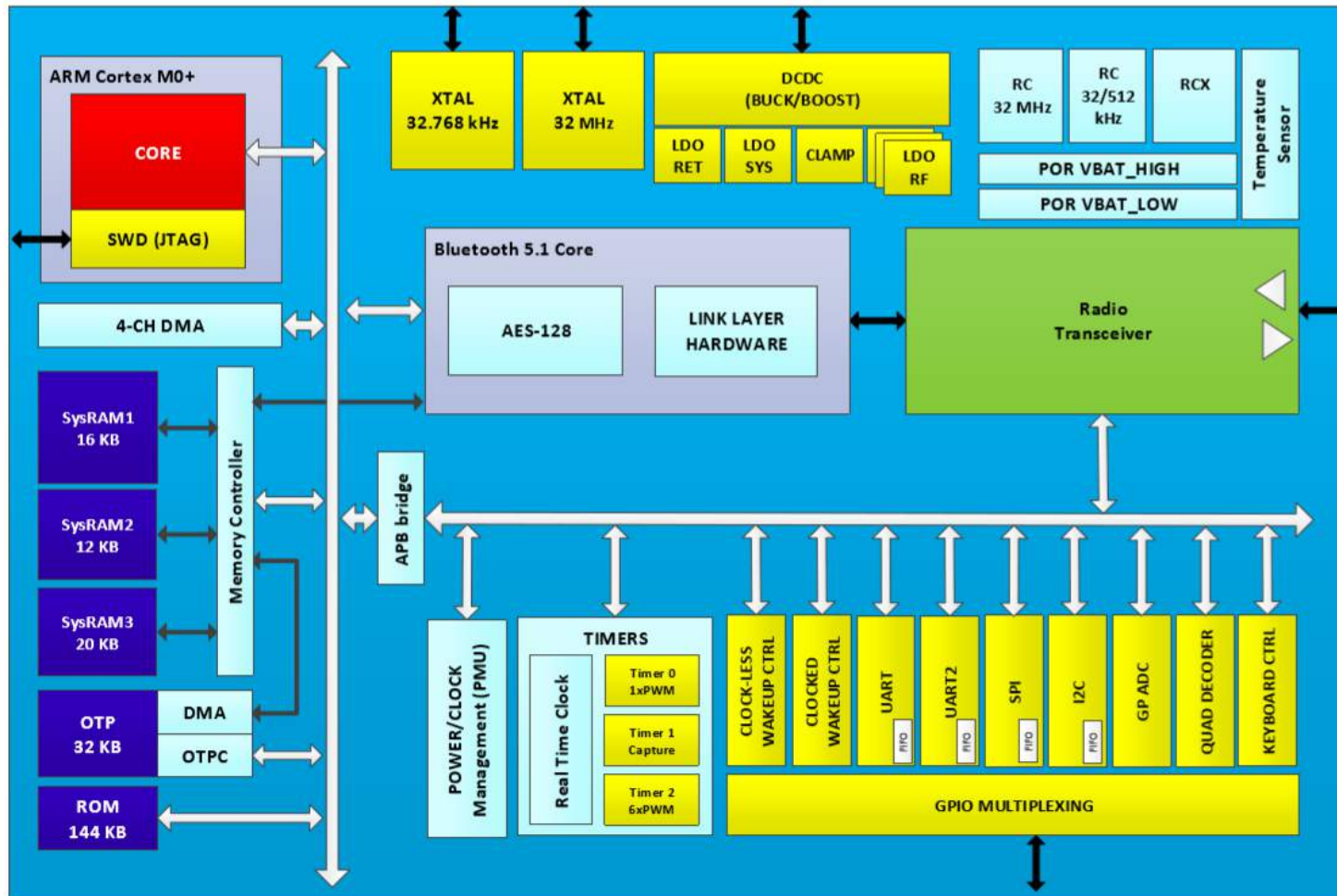
- 3.5mA Tx current - 40% lower than key competitor
- 2.2mA Rx current - 64% lower than key competitor
- 240nA hibernation - 20% lower than key competitor



Objective, standardized benchmarking framework for measuring the energy efficiency of internet of things (IoT) edge nodes, a platform with three primary parts: a sensor, a processor, and a radio interface.

Source: EEMBC website

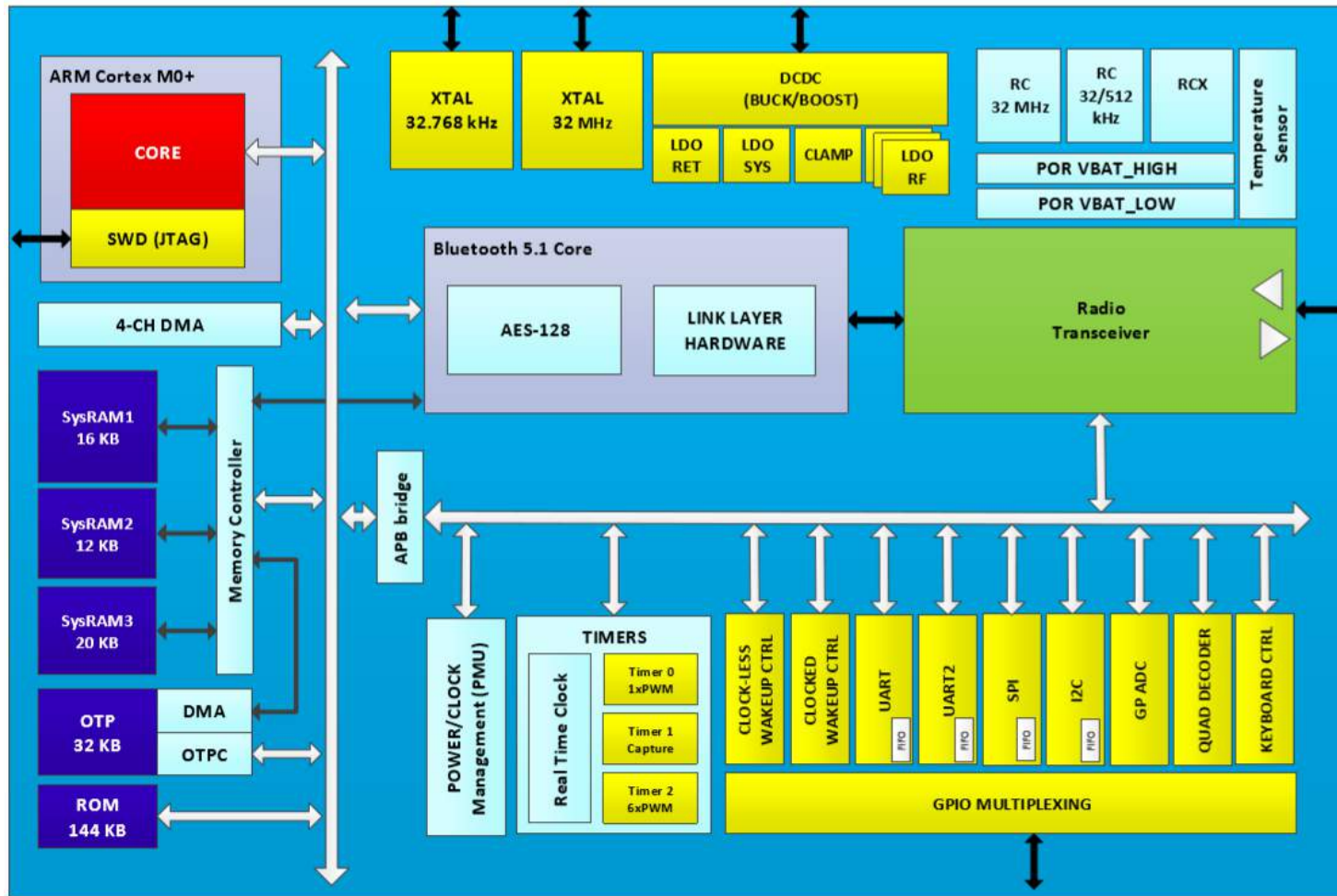
DA14531 SMARTBOND TINY™ BLOCK DIAGRAM



Key Features 1/2

- Complies with Bluetooth® LE V5.1
- ARM M0+ at 16MHz
- Memory:
 - 48kB RAM (12KB, 20KB, 16KB)
 - 32kB OTP and 144kB ROM
- Power Management:
 - Integrated Buck/Boost DCDC and DCDC by-pass
 - Works with Coin cell, disposable printed batteries, Silver Oxide and Alkaline cells
- Active current:
 - Tx 3.5mA and Rx 2.2mA @3.0V with DCDC on
 - Tx 8.0mA and Rx 5.0mA @1.1V with DCDC on
- Sleep currents
 - 150nA/240nA at 5C/25C hibernation (boost mode)
 - 700nA hibernation with all RAM active (boost mode)
 - 1.6uA extended sleep with all RAM

DA14531 SMARTBOND TINY™ BLOCK DIAGRAM



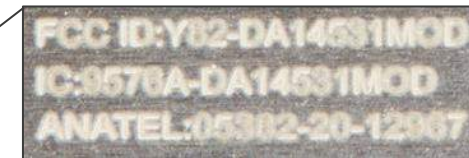
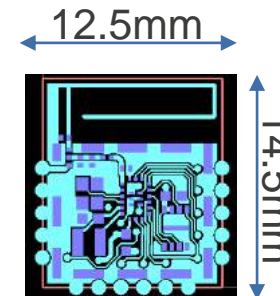
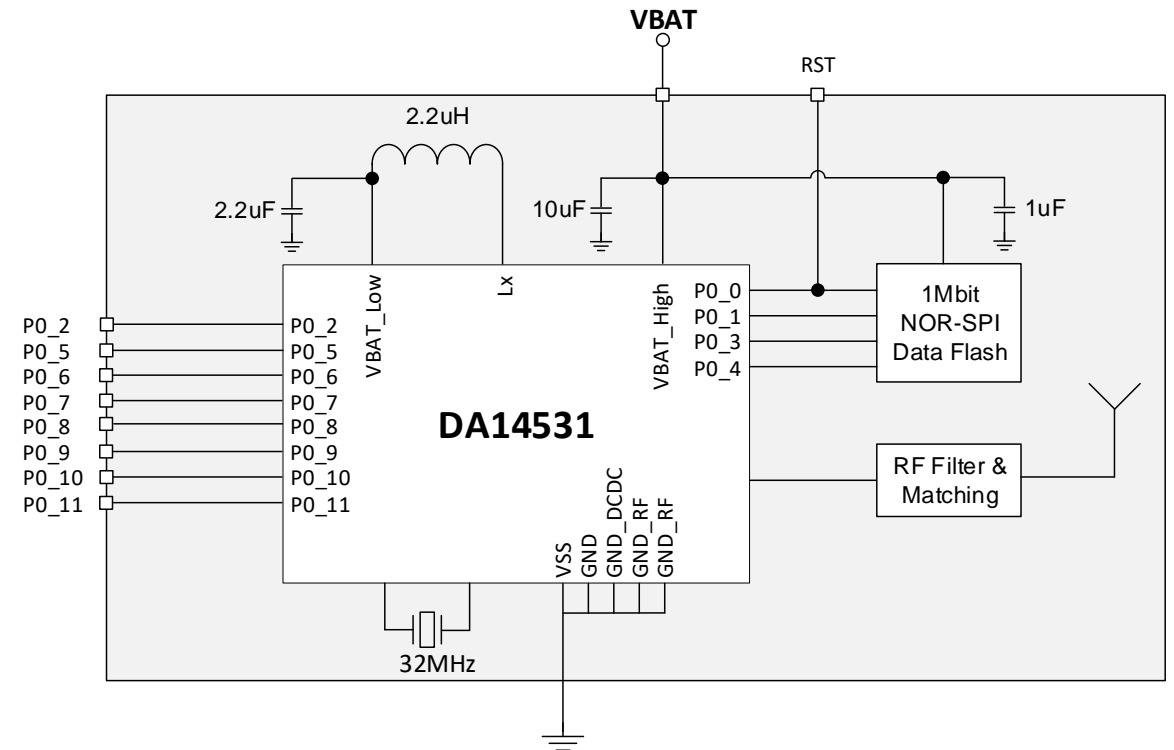
Key Features 2/2

- Sensitivity
 - -94dBm and up to +2.5dBm Tx power
- Clock Oscillators (32MHz, int 32kHz)
 - Active 32MHz, Sleep: 32kHz and RCX
- 3x Timers, 1x RTC (10ms granularity), 7PWM
- Temperature sensor (+/- 4oC)
- GP-ADC 11 bit resolution (4 channel)
- 2x UART, 1xSPI, 1xI2C
- Quad decoder (3 channels)
- Keyboard controller
- GPIOs
 - 12 in 2.2x3.0mm GQFN24 package
 - 6 in 1.7x2.0mm WLCSP package

DA14531 SMARTBOND TINY™ MODULE

WORLD'S LOWEST POWER BLUETOOTH® LE MODULE

- 2mA module current in Rx
- 4mA module current in Tx @0dBm
- 1.8uA module current in sleep mode
- High quality build, but very cost effective
- Bluetooth 5.1 core qualified
- Worldwide qualification & certification, all test reports available (FCC, CE, others)
- Integrated antenna design
- Software Update Over The Air (SUOTA) support
- 1Mb FLASH onboard
- -93dBm sensitivity
- -19 to +2.2dBm output power
- 8GPIO for I/O, ADC, SPI, I2C, PWM, Timers

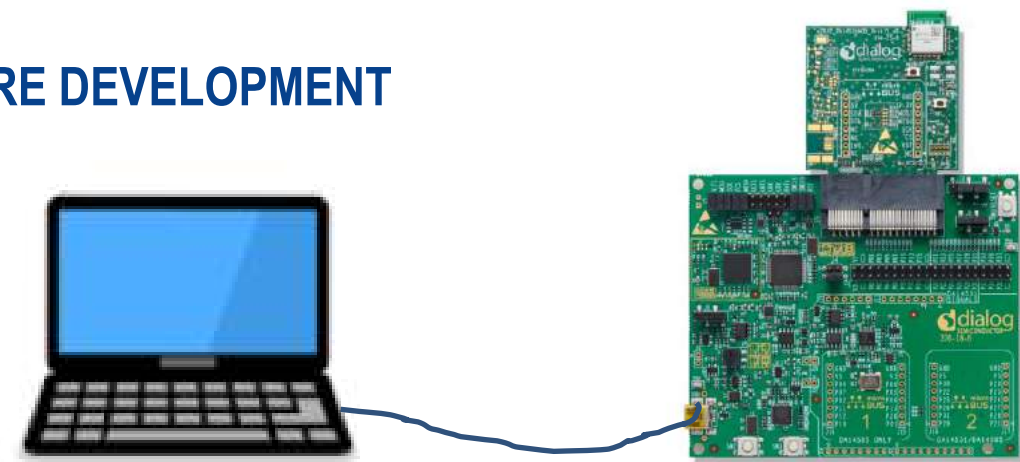


DA14531 SMARTBOND™ MODULE

EASE OF USE SOFTWARE OPTIONS WITH ZERO SOFTWARE DEVELOPMENT

Software support

- Flash programmer with automatic hardware recognition
- Select the correct software and program the flash
- Software support options: From zero touch to advanced SDK approach
- CodeLess™ and DSPS as zero software development options
- Just minutes from connecting the hardware to running a blinky project



Software Design Selection Matrix

	DSPS SmartConfig	Codeless	GTL	HCI	SDK 6 Approach
MCU use	External MCU	External MCU or standalone application	External MCU for control (SW on chip/module)	External MCU for host stack	Standalone or External
Required BLE knowledge	Low	Low	Medium	High	High
Required software skills	Low	Low	Good	Good	Good
Flexibility	Low	Low/Medium	Medium	High	High
Ease of Use	Very High	High	Medium	Medium	Medium
Time-to-Market	Very short	Short	Medium	Long	Long

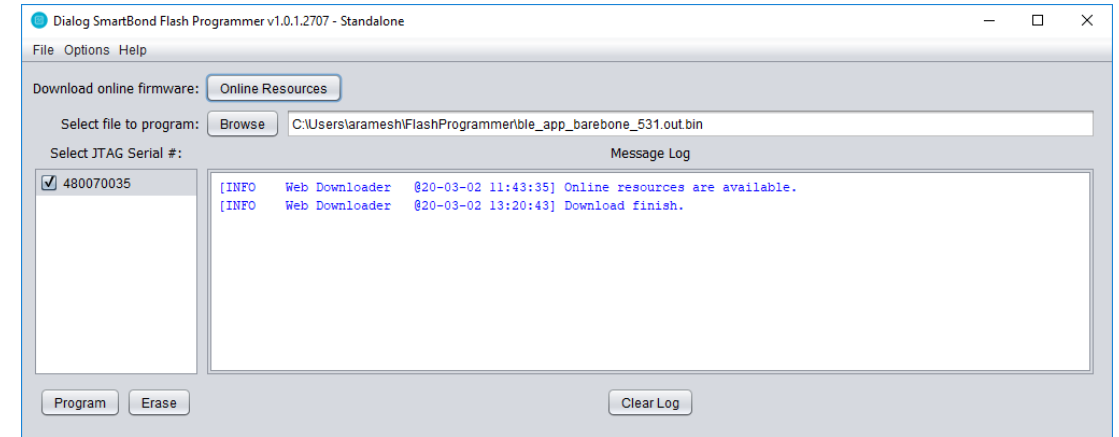


PROGRAMMING THE DA14531 SMARTBOND™ MODULE

PROGRAMMING SOLUTIONS FOR EVERY STAGE FROM DEVELOPMENT TO MASS PRODUCTION

Programming support for the DA14531 module

- Super simple flash programmer
 - Connects development kit to PC with auto detection of DK
 - Download, select firmware and hit programming button
- Software Update Over The Air (SUOTA)

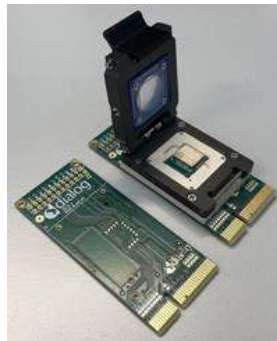


PROGRAMMING DURING DEVELOPMENT

By using DA14531
Module development kit



By using development kit &
module socket



design files available

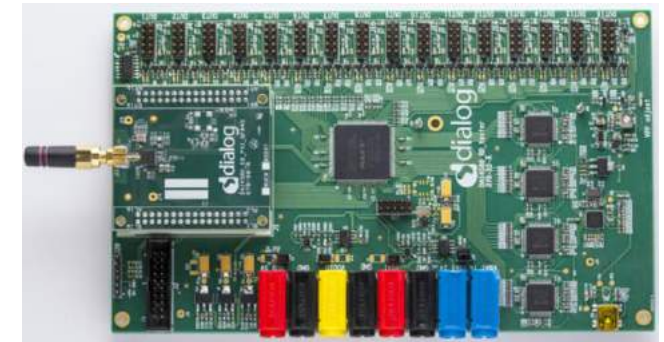
By using a manual socket
programmer



<http://www.praxisrf.com/~shop/main.html>

MASS PRODUCTION

By Using Dialog Production Line Toolkit



DA1453X MARKETS

TARGET APPLICATIONS

- Connected Health: Injectors, inhalers, blood pressure monitors, patches
- Easy commissioning of equipment with an app
 - STB, printer, camera, coffee maker, access points
- Low-cost remote controls
- PC accessories, mice, stylus pens
- Toys
- Simple wireless sensors, e.g., wireless temperature meters
- Cold food / medicine chain monitoring
- Asset tracking in hospitals, factories, distribution centers
- Active RFID replacement
- Simple Bluetooth LE pipes added to existing MCU designs
- Low cost, proprietary direction finding



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