CC3100/CC3200 SimpleLink^{TM} Wi-Fi$^{®}$
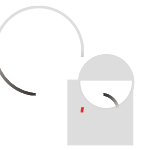
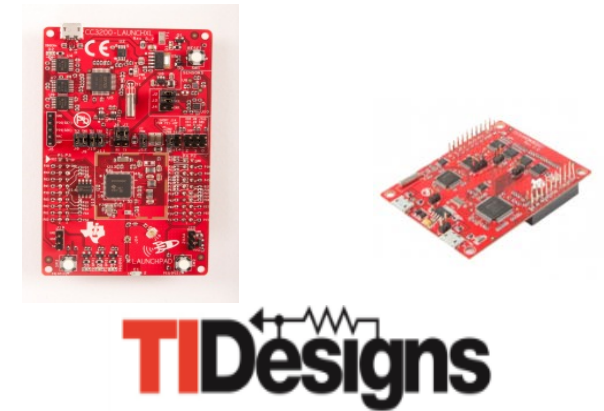*The Internet of Things Made Simple*

Aaron Lee

SimpleLink™ Wi-Fi® platform
Lowest power, programmable wireless MCU, easiest to use

Value Propositions

- **The lowest power:** Run for over a year on two AA batteries

- **First single chip programmable Wi-Fi solution:** Add Wi-Fi to any system

- **Easiest to design with**: No Wi-Fi experience needed; HW designs, 30+ software examples, extensive documentation and TI E2E support forum all readily available

Products

- CC3200 Wireless MCU
- Integrated ARM Cortex-M4 MCU + Wi-Fi network processor
  - First programmable single chip Wi-Fi solution

- CC3100 Wi-Fi network processor
  - Embedded TCIP/IP stack
  - Connect any MCU to the Internet of Things
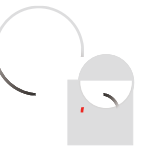
Features

- On-chip Internet & Wi-Fi security

- Wireless MCU separate from TCP/IP Stack, free for customer applications

- Flexible provisioning: AP mode, WPS, SmartConfig and more

- Cloud supported

- FCC/CE/ETSI/TELEC certified modules

- SDK for development with Code Composer Studio and IAR support
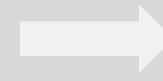
Applications

- Internet of Things (IoT)

- Home automation & appliance

- Safety and security

- Smart energy

- Industrial M2M communication

- Wireless audio streaming
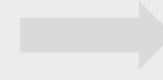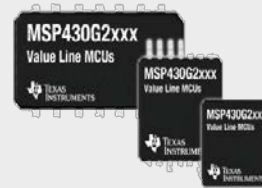
CC3100/CC3200 benefits for Internet of Things
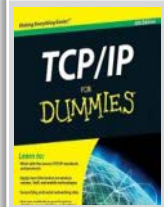
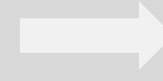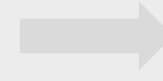|		
Industry standard BSD socket API for TCP/IP communication	→	**Build Internet applications quickly, reuse internet available source code**
Small driver footprint As low as 7KB host code	→	**Enable integration with low-cost, low power MCUs like MSP430**
TLS/SSL Internet security, HW crypto engine	→	**Establish TLS connection in 200mSec for fast and secured user experience**
Low power radio and advanced low power modes	→	**Wi-Fi® sensors stay connected to the network for over a year using two AA batteries**
Most Flexible Provisioning options – Access Point mode, WPS, Smartconfig™	→	**Enables customers to set up devices easily and fast**
TI modules certified for WW regulatory and Wi-Fi Alliance	→	**Fast time to market Save customers over $50K of test cost and test time per product family**
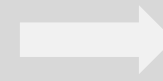
TEXAS INSTRUMENTS

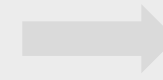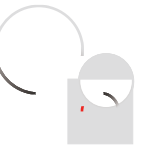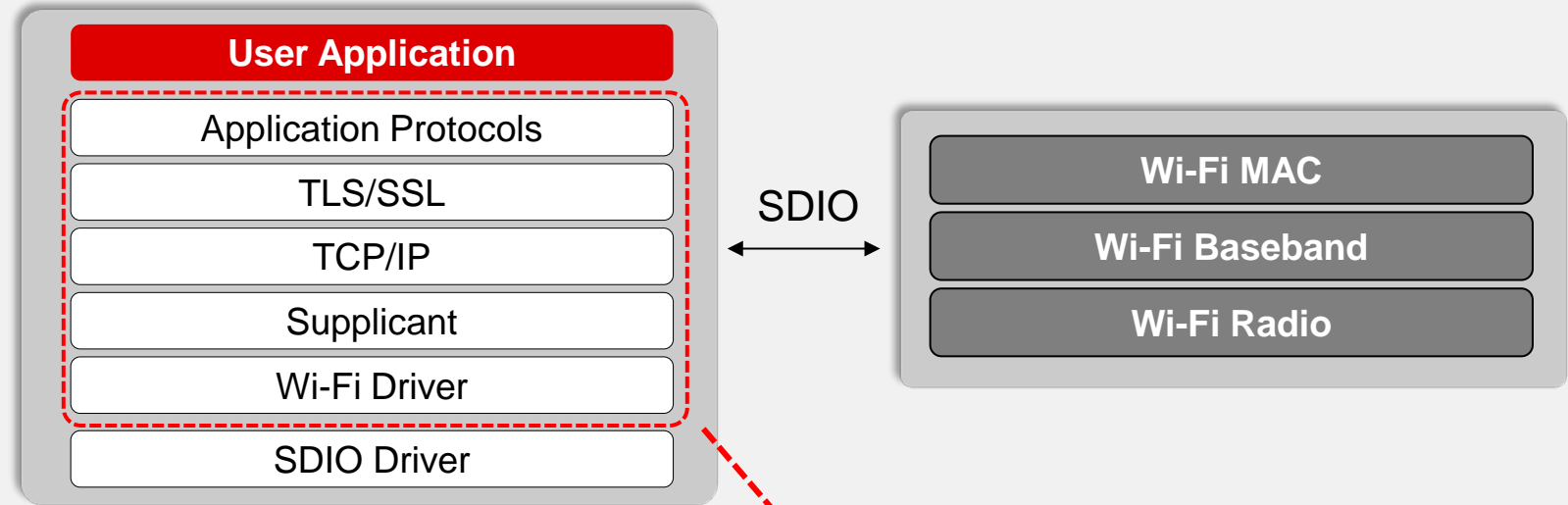# The SimpleLink™ Embedded Wi-Fi® Advantage

Traditional Wi-Fi

- **Designed for powerful microprocessors**

User Application

Application Protocols
TLS/SSL
TCP/IP
Supplicant
Wi-Fi Driver
SDIO Driver

SDIO →

Wi-Fi MAC
Wi-Fi Baseband
Wi-Fi Radio

SimpleLink™ CC3100/CC3200

- **Nearly all Wi-Fi and networking functions already handled by the Network Processor**

- **Use low capability MCU (7KB Flash & 700B RAM)**

- **Less** expertise

- **Lower** system cost

- **Faster** time to market

User Application

SimpleLink Driver
SPI or UART Driver

SPI or UART →

Application Protocols
TLS/SSL
TCP/IP
Supplicant
Wi-Fi Driver
Wi-Fi MAC
Wi-Fi Baseband
Wi-Fi Radio

TEXAS INSTRUMENTS
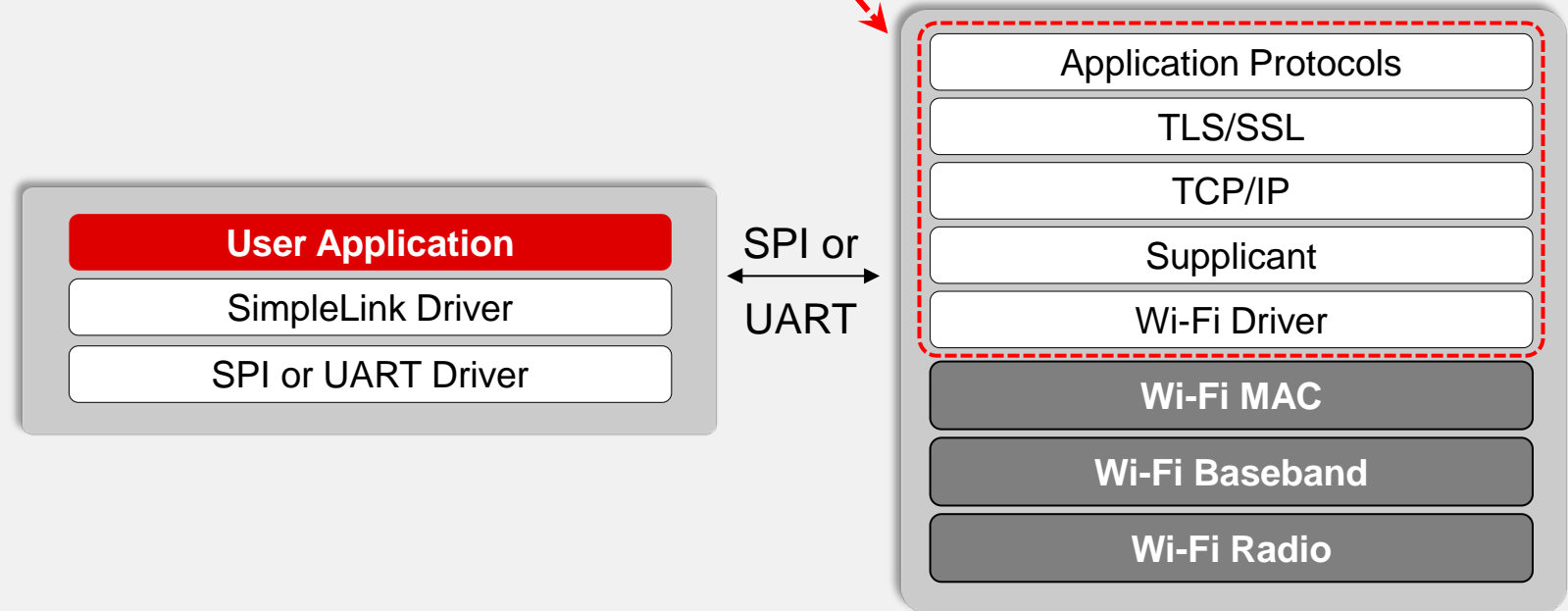
Connecting applications with TI Wi-Fi®

WiLink™

WL183xMOD
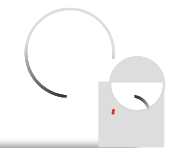
Highest Performance & Integration

Wi-Fi, BT/BLE combos
Attaches to MPUs (Sitara)
TI certified module

Portable consumer & enterprise, Automotive, Connected Home, Smart Energy, Health

WL180xMOD

Highest Performance

Wi-Fi
Attaches to MPUs (Sitara)
TI certified module

SimpleLink™

CC3100

Wi-Fi Network Processor

Internet-on-a-chip™ solution
Integrated Wi-Fi, internet and security protocols
Attaches to MCUs

Home automation, Smart energy, connected appliances, M2M communication, Health & fitness

CC3200

Wireless MCU

Same features as C3100 + customer programmable Cortex M4 MCU

Module and QFN Device

TEXAS INSTRUMENTS
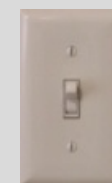
CC3100/CC3200 Applications

Home & Building Automation

- Add intelligence to household appliances, and automate everyday tasks to streamline peoples lives

Smart Energy

- Add power awareness to products and help to save energy

Multimedia

- Wireless audio streaming and advanced remote controls

Security and Safety

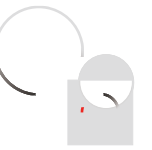- Enable building security and monitoring without wired infrastructure

Industrial M2M Communication

- M2M communication, statistics recording, and using existing Wi-Fi infrastructure

TEXAS INSTRUMENTS

SimpleLink™ Wi-Fi Family

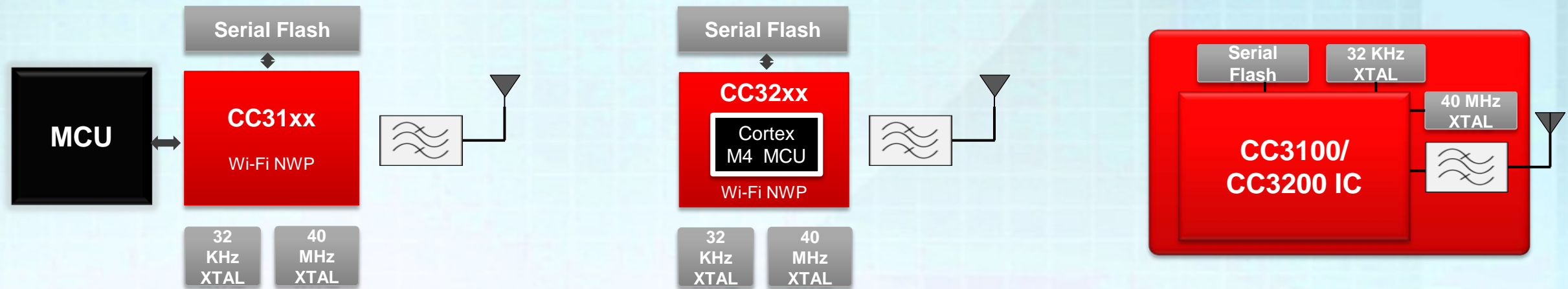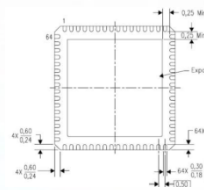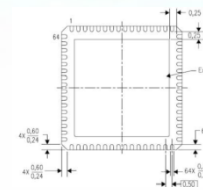|	**CC3100**	**CC3200**	**CC3100MOD and CC3200MOD**
SimpleLink Solution	• Wi-Fi® Network Processor • Customer Application runs on an external MCU	• Cortex M4 Applications processor + Wi-Fi® Network Processor • M4 Application stored on Serial Flash	• Modular certification for FCC, IC, CE, TELEC, SRRC

System Diagram

Package

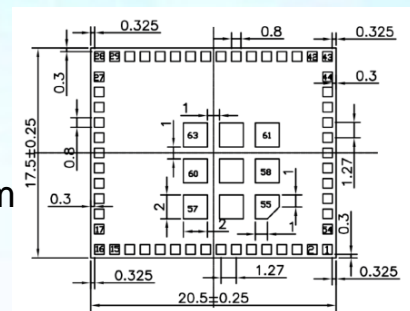QFN (64)
9.0 mm x 9.0 mm

QFN (64)
9.0 mm x 9.0 mm

MOB (63)
20.5 mm × 17.5 mm
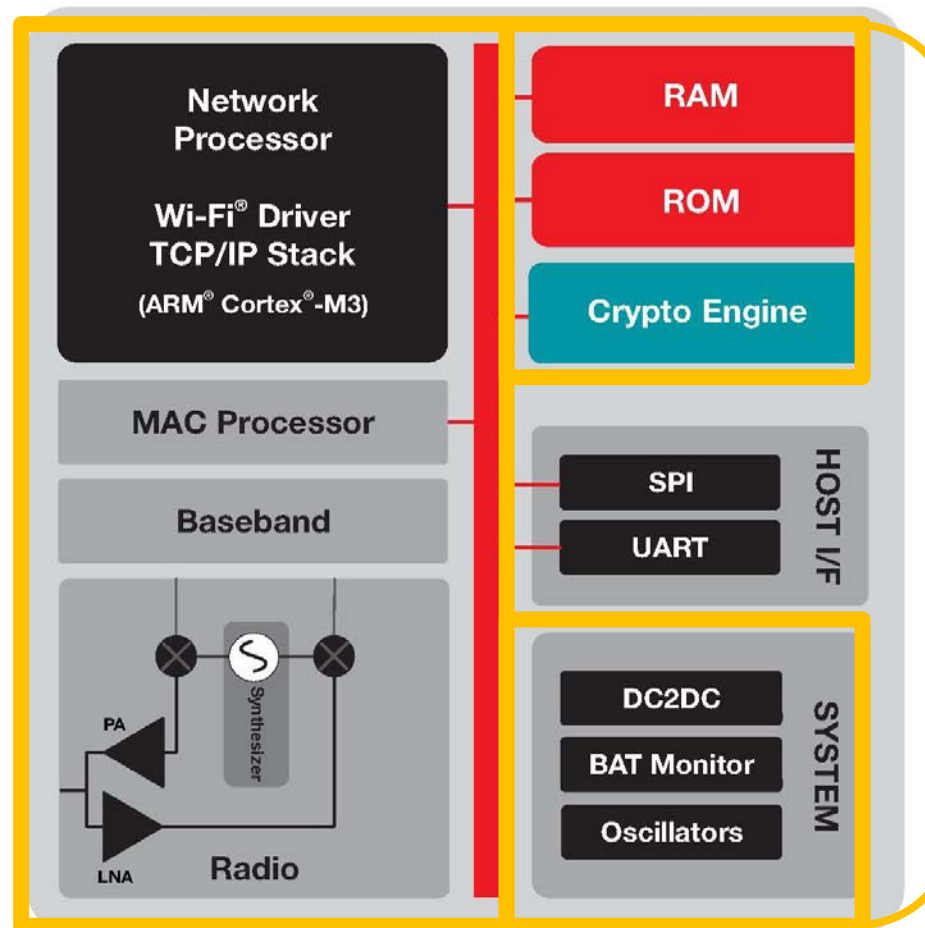
TEXAS INSTRUMENTS

Deep dive into CC3100 & CC3200

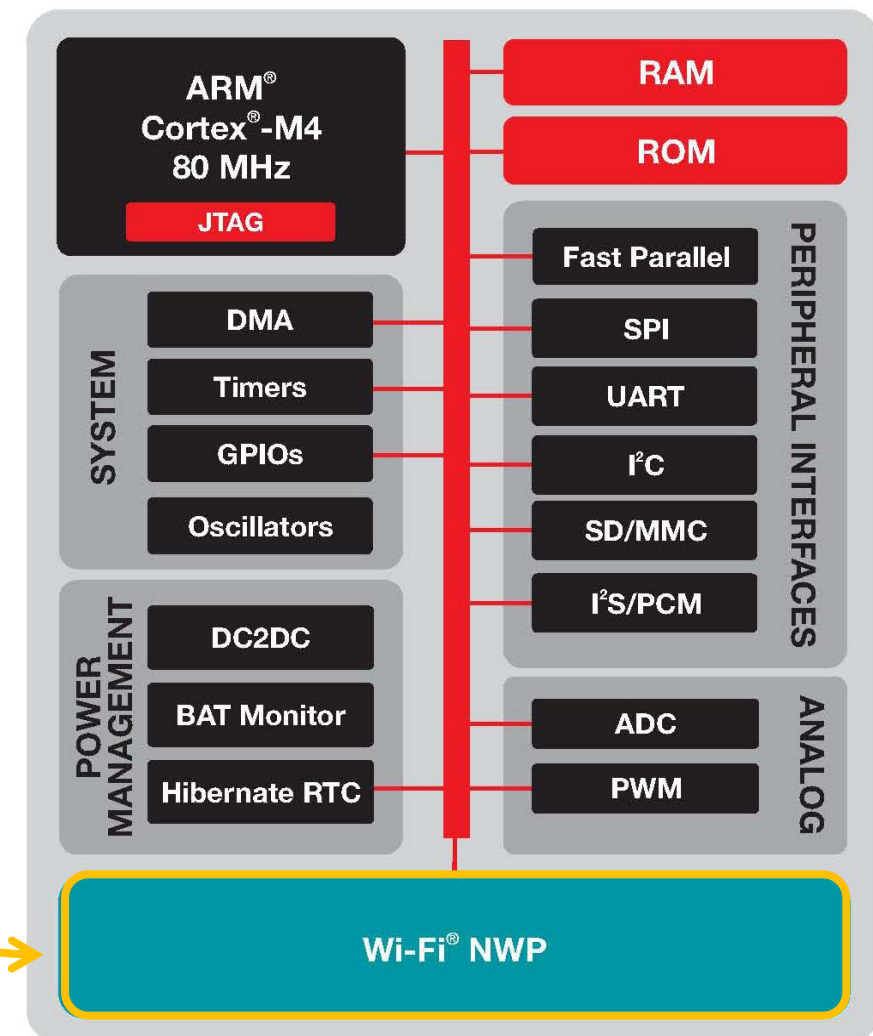Two pin compatible products based on the same Wi-Fi network processor

CC3100 Internet on a chip
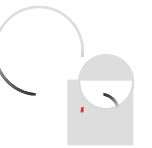Wi-Fi Network Processor
Embedded TCP/IP stack for systems using external low-cost MCU

CC3200 MCU + Internet
Wireless MCU
80MHz ARM® Cortex™-M4 integrated + Wi-Fi network processor

TEXAS INSTRUMENTS

Wi-Fi Provisioning for Embedded Devices

How will my product connect to a Wi-Fi access point?

No display? No keyboard? No UI at all? **No problem.**

Ease of Use: Achieving AP connection for products without a UI

SimpleLink supports 3 provisioning methods:

- ✓ **AP mode** – connect to device from any Smartphone / tablet and configure using phone UI. Industry most common provisioning method.

- ✓ **WPS** – Requires both AP support and physical access to the product. Industry standard

- ✓ **SmartConfig** – TI Propriety method. One step and secure configuration. Works for most network topologies, and can be used to supplement AP mode or WPS

Most Flexible Wi-Fi provisioning Options

Provisioning Method	Access Point Mode*	SmartConfig™	WPS
What's needed	Web browser	Android or iOS phone app	Push button on router
Networks supported	Any Network	Most networks	WPS enabled routers only
How many Steps	Multiple Steps	1 step	1 step (push button)
Number devices configured	Configure one device	Configure multiple devices	Configure one device
Home network connection	Phone must disconnect from home network	Phone stays connected to the home network	N/A
Secure?	Secure	Secure	Not secured

http://processors.wiki.ti.com/index.php/CC31xx_&_CC32xx_Provisioning

TEXAS INSTRUMENTS

Built-in security - All on Chip
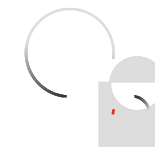
On Chip Wi-Fi® security

- ❑ **WPA2 Personal**
- ❑ **WPA2 Enterprise**
- ❑ **WPS2**
- ❑ **802.1x**
- ❑ **EAP Fast**
- ❑ **EAP PEAPv0/1**
- ❑ **EAP PEAPv0 TLS**
- ❑ **EAP PEAPv1 TLS**
- ❑ **EAP TLS**
- ❑ **EAP TTLS TLS**
- ❑ **EAP TTLS MSCHAPv2**

On-Chip Internet security

- ❑ **SSL 3.0**
- ❑ **TLS 1.2**
- ❑ **X.509**
- ❑ **DES3**
- ❑ **AES256**
- ❑ **MD5**
- ❑ **SHA2**
- ❑ **RSA**
- ❑ **ECC**

SimpleLink™ Wi-Fi® Family
CC3100 Internet on chip
CC3200 Internet on chip + MCU

Texas Instruments

HW encryption engines establish TLS/SSL connection in ~200 mSec

Low Energy Consumption for Battery Powered Devices

Intermittently Connected

1. Connect to access point
2. Communicate
3. Hibernate for seconds, minutes, hours or days
4. Return to Hibernate
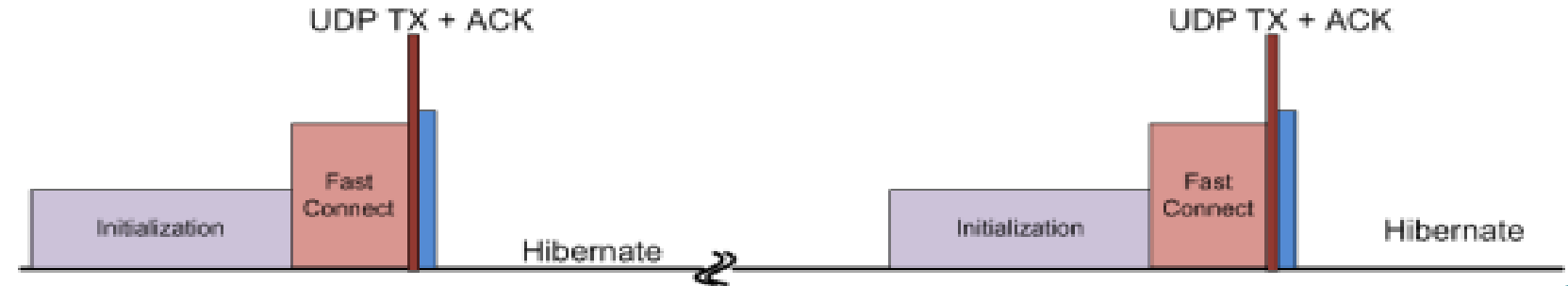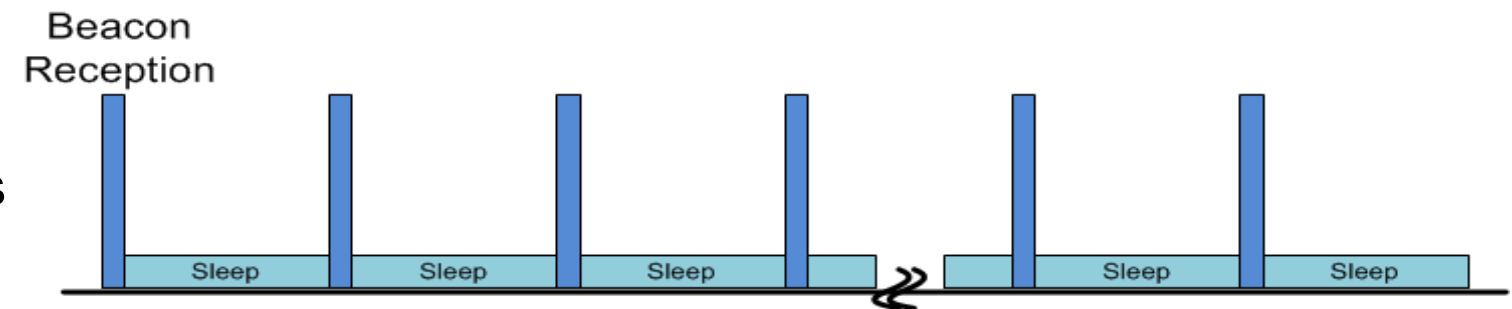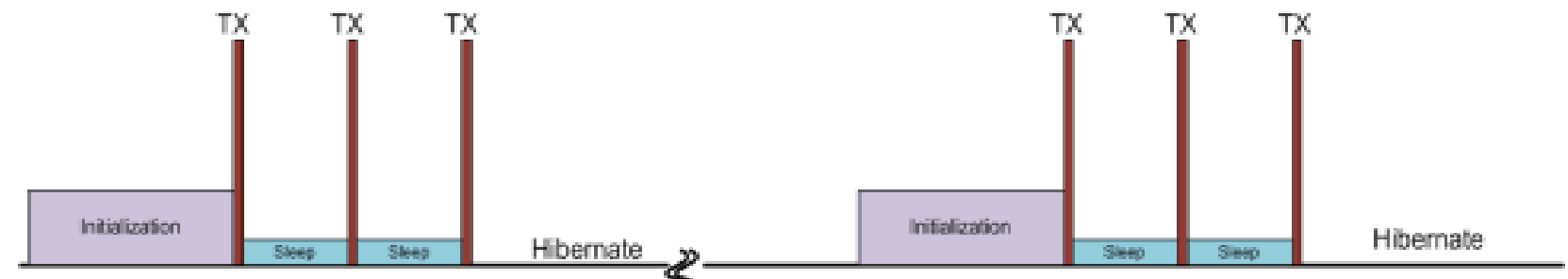
Always on / Idle Connected

Keep connection with AP/Server
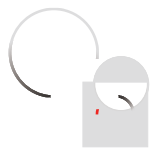Goes to **Low Power Deep Sleep** between TX/RX activities

RTLS / TAG Use Case

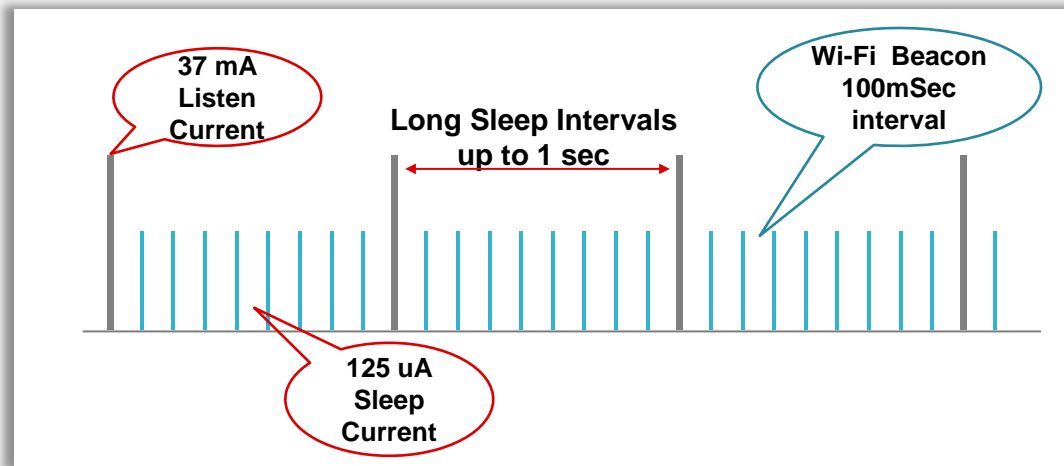1. Start as a transceiver
2. Send packets
3. Hibernate

TEXAS INSTRUMENTS
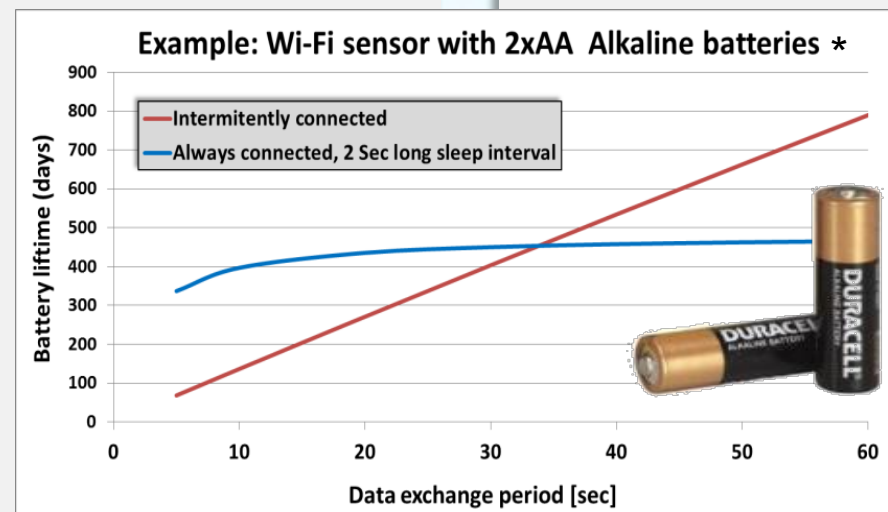
Low Energy Consumption for Battery Powered Devices

Always On/ Idle Connected

- **System is connected to AP and can respond immediately**
- **Industry lowest power while maintaining connection to AP.**
  - **Further optimization using unique <u>long sleep interval</u> feature**

37 mA Listen Current

Long Sleep Intervals up to 1 sec

Wi-Fi Beacon 100mSec interval

125 uA Sleep Current

Intermittently Connected

- **System is in hibernate mode and wakes up for intermittently communication with server**
- **Fast reconnection to AP and Internet using unique fast connect feature**

95 mSec from hibernate to secure Wi-Fi connection

200 mSec for secure TLS connection

Long hibernate intervals

4 uA Hibernate Current

Example: Wi-Fi sensor with 2xAA Alkaline batteries *

- Intermitently connected
- Always connected, 2 Sec long sleep interval
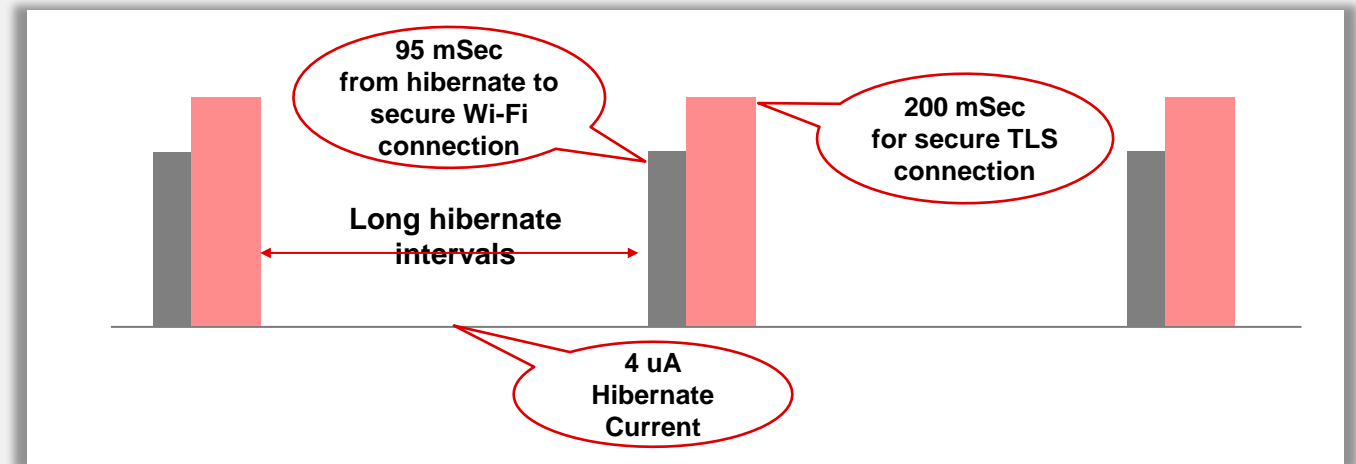
*Battery life can vary significantly depending on use case and system design

Low Power Leadership – Intermittently Connected

- **Fast Connect Profile - Setup:**
    - No Security
    - Tested in clean environment
    - Tested with Cisco 1252
    - Device connect to AP, send 1 UDP packet, wait for ACK and hibernate (Repeat in a loop)
    - MSP430 + CC3100 device

Results:

- **3576uC** per cycle. Transmit single UDP packet with Static IP (including the connection)
- **64.6uA** average for Fast Connect cycle every 60sec

Notes:

- Tested on Production device
- SFLASH current included (20uA)
- Vbat 3.3v
- Static IP

TEXAS INSTRUMENTS
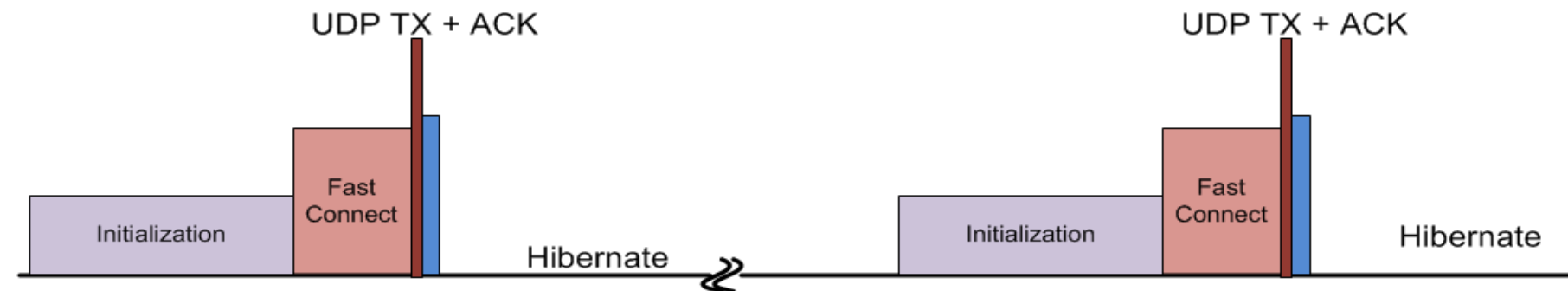
Low Power Leadership – Always Connected

- **Always Connected - Setup:**
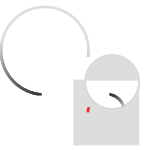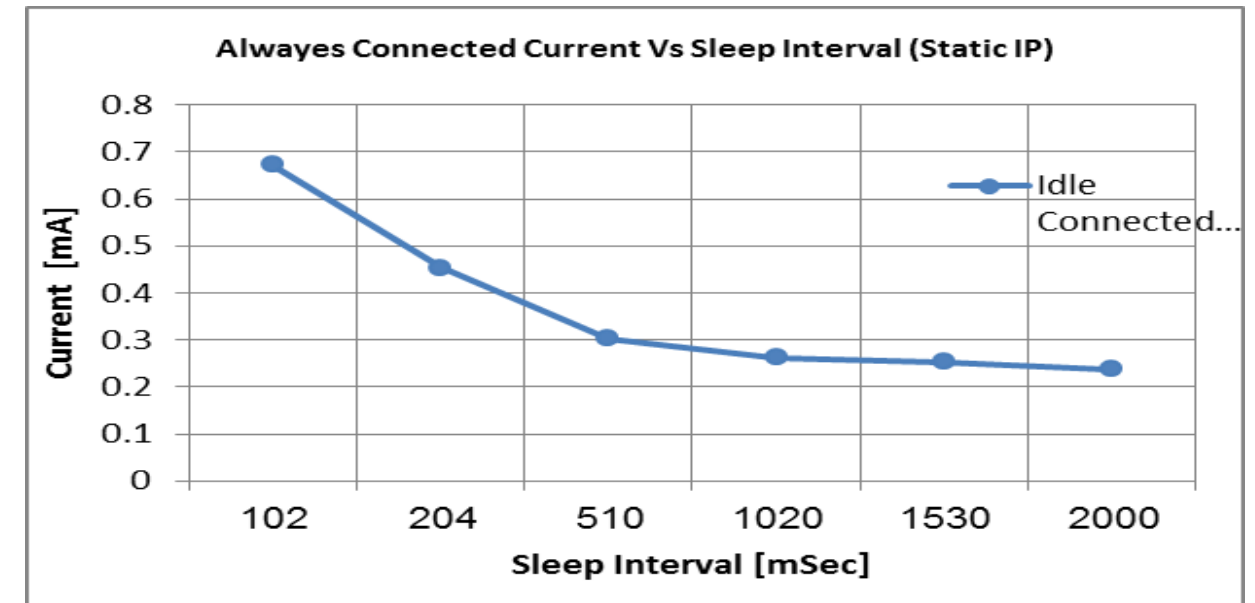 - No Security
  - Tested in clean environment
  - Tested with Cisco 1252
  - STA keep connection with AP (monitoring beacon reception)
  - MSP430 + CC3100 device

PM Mode	Time interval in mSec	Current in mA (Static IP) mA	Current in mA (DHCP)mA
Default	102	0.672	0.691
LSI	204	0.453	0.464
LSI	510	0.303	0.312
LSI	1020	0.262	0.278
LSI	1530	0.253	0.269
LSI	2000	0.237	0.267

Notes:

- **LSI** – Long Sleep Interval Power Mode– Define the wakeup interval of the device
- SFLASH current included (20uA)
- Vbat 3.3v

Alwayes Connected Current Vs Sleep Interval (Static IP)

Beacon Reception

TEXAS INSTRUMENTS
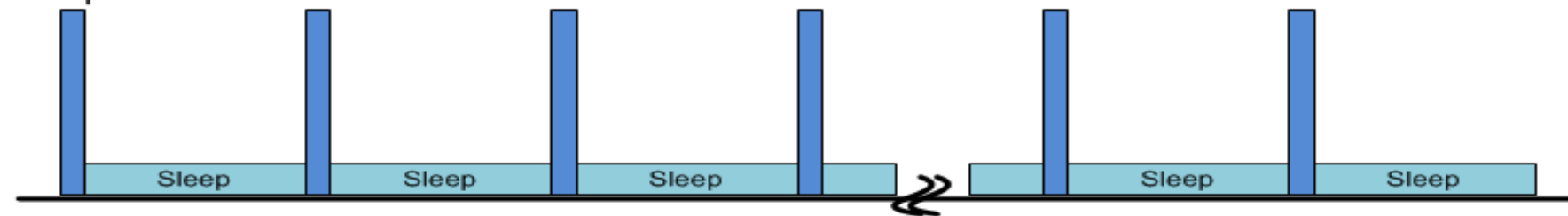
Low Power Leadership – Always Connected

- **Connected Profile With Various AP - Setup:**
  - Tested in clean environment
  - Tested with 174 AP – default configuration
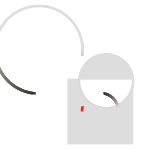 - STA keep connection with AP (monitoring beacon reception) – Measured over 1Min
  - CC3100 device

Results:
  - <1mA current with 116 tested AP (~65%)
  - <2mA current with 148 of the tested AP (~82%)
  - High Jitter and Drift of Beacon in some AP results in Increase of power consumption

Notes:
- SFLASH current included (20uA)
- Vbat 3.3v
- Device power policy is at default (wake for every Beacon)

Device Connected Current With Various Access Points
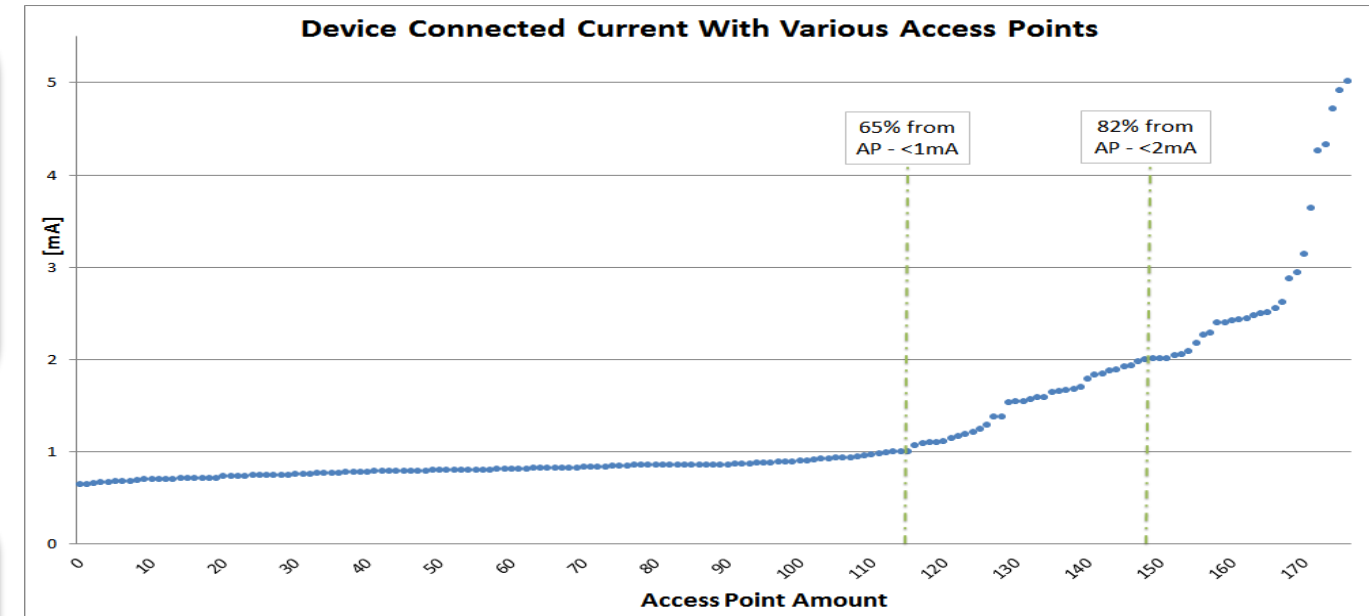
% of APs for Connected Mode Current

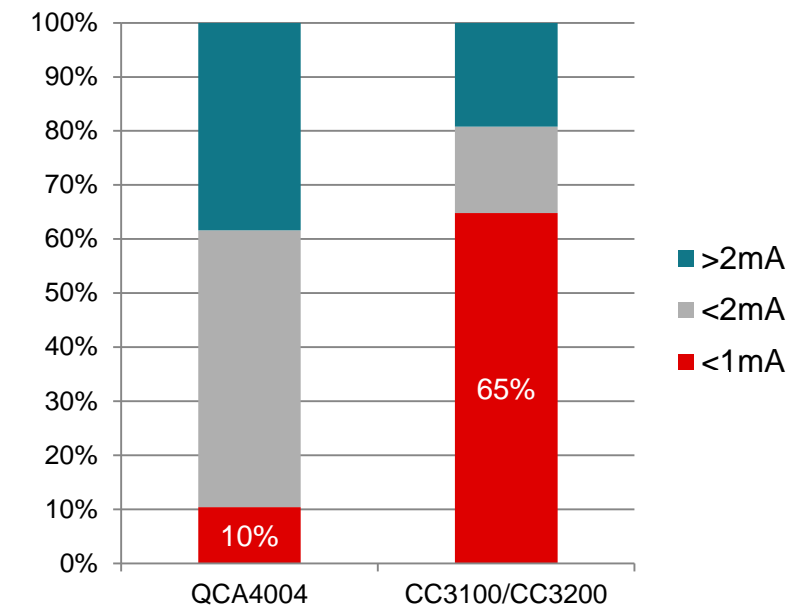# Low Power Leadership – RTLS Profile

- **RTLS Profile - Setup:**
    - No Security
    - Tested in clean environment
    - Tested with Cisco 1252
    - Device in Disconnect mode, send 3 packet (Transceiver mode) and hibernate (Repeat in a loop)
    - MSP430 + CC3100 device

Results:

- **3183uC** per TAG cycle that contains 3 short packets at 30ms delay between them
- **57.8uA** average for TAG cycle every 60sec

Notes:

- SFLASH current included (20uA)
- Vbat 3.3v

TEXAS INSTRUMENTS

SimpleLink CC3100 Wi-Fi® NWP overview
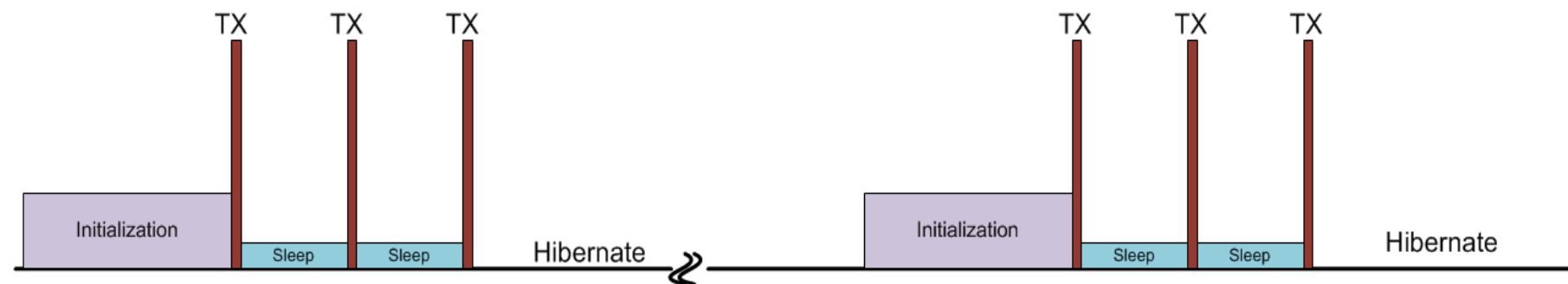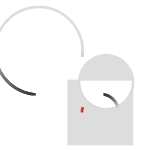
- **Best-in-class Wi-Fi core**
  - 802.11 b/g/n radio/baseband/MAC

- **Powerful Crypto engine**
  - Enables fast secured WLAN and Internet connections w/ 256 bit encryption

- **Built in Power Management**
  - Integrated DC2DC
  - Advanced low power modes

- **Integrated ARM® Cortex™-M3 MCU**
  - Dedicated to WLAN and TCP/IP stack
  - Offloads the host application processor

- **Host Interfaces**
  - Interfaces with 8/16/32 MCUs over a SPI or UART
  - SimpleLink driver has low memory footprint on host

TEXAS INSTRUMENTS
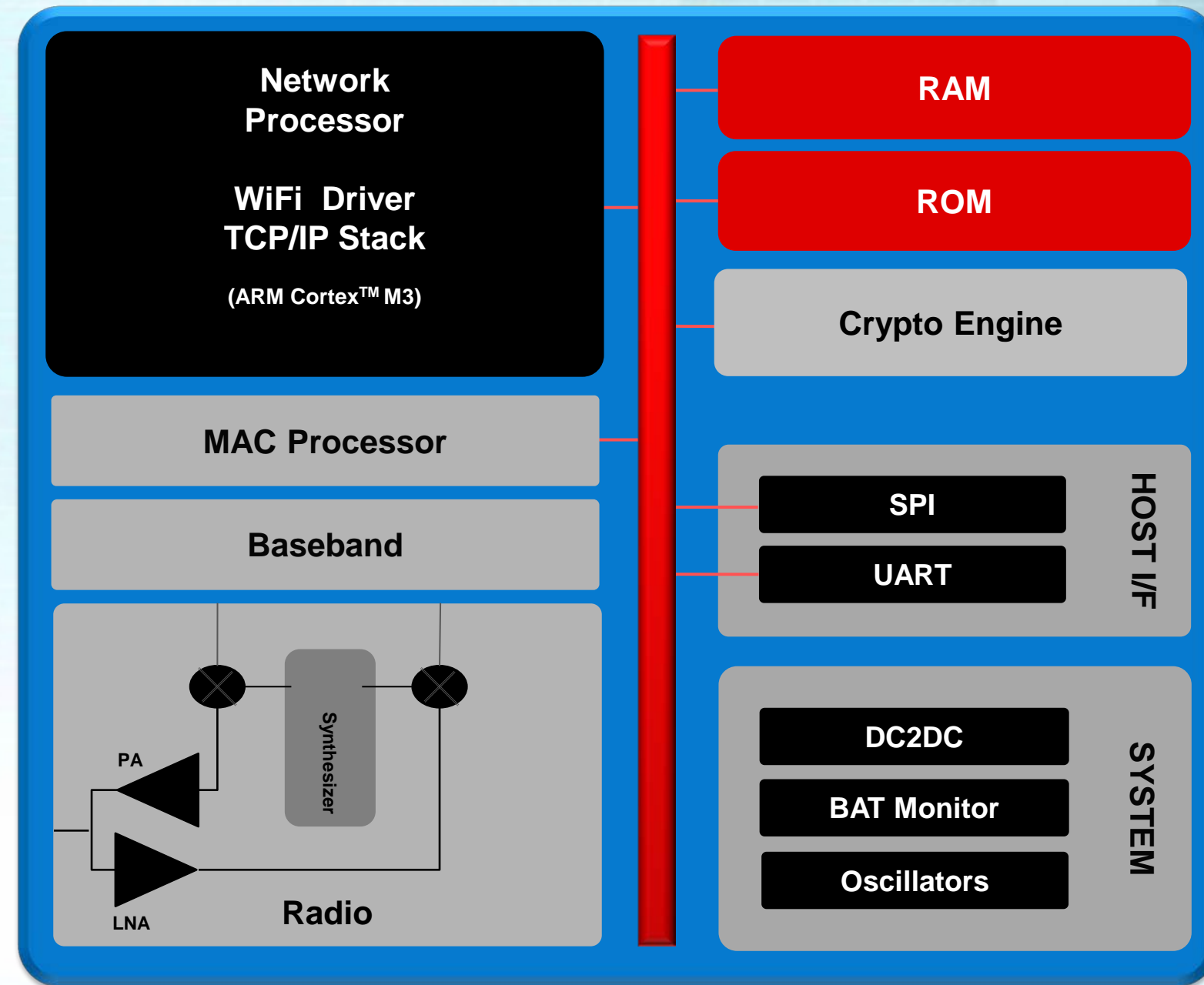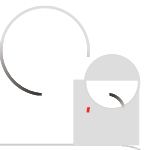
SimpleLink CC3200 Hardware Overview

- **ARM® Cortex™ M4 Core @ 80MHz**
- **Memory options**
  - RAM (up to 256KB)
  - External Serial Flash Bootloader
  - Peripherals Drivers in ROM
- **Rich peripheral interfaces (32 I/O pins)**
  - SPI (20 MHz max)
  - UART (5Mbps max),
  - I2C, I2S, SDMMC
  - 4-channel 12 bit ADC (0.5MSPS)
  - Parallel Interface
  - 4 PWM controls
  - Up to 27 GPIOs
- **Built in Power Management**
  - Integrated DC2DC
  - Advanced low power modes
  - Hibernate mode with RTC
- **Wi-Fi® Network Processor**
  - 802.11 b/g/n STA, AP, P2P
  - IPv4 TCP/IP Stack
  - SimpleLink™ drivers and ease of use

TEXAS INSTRUMENTS
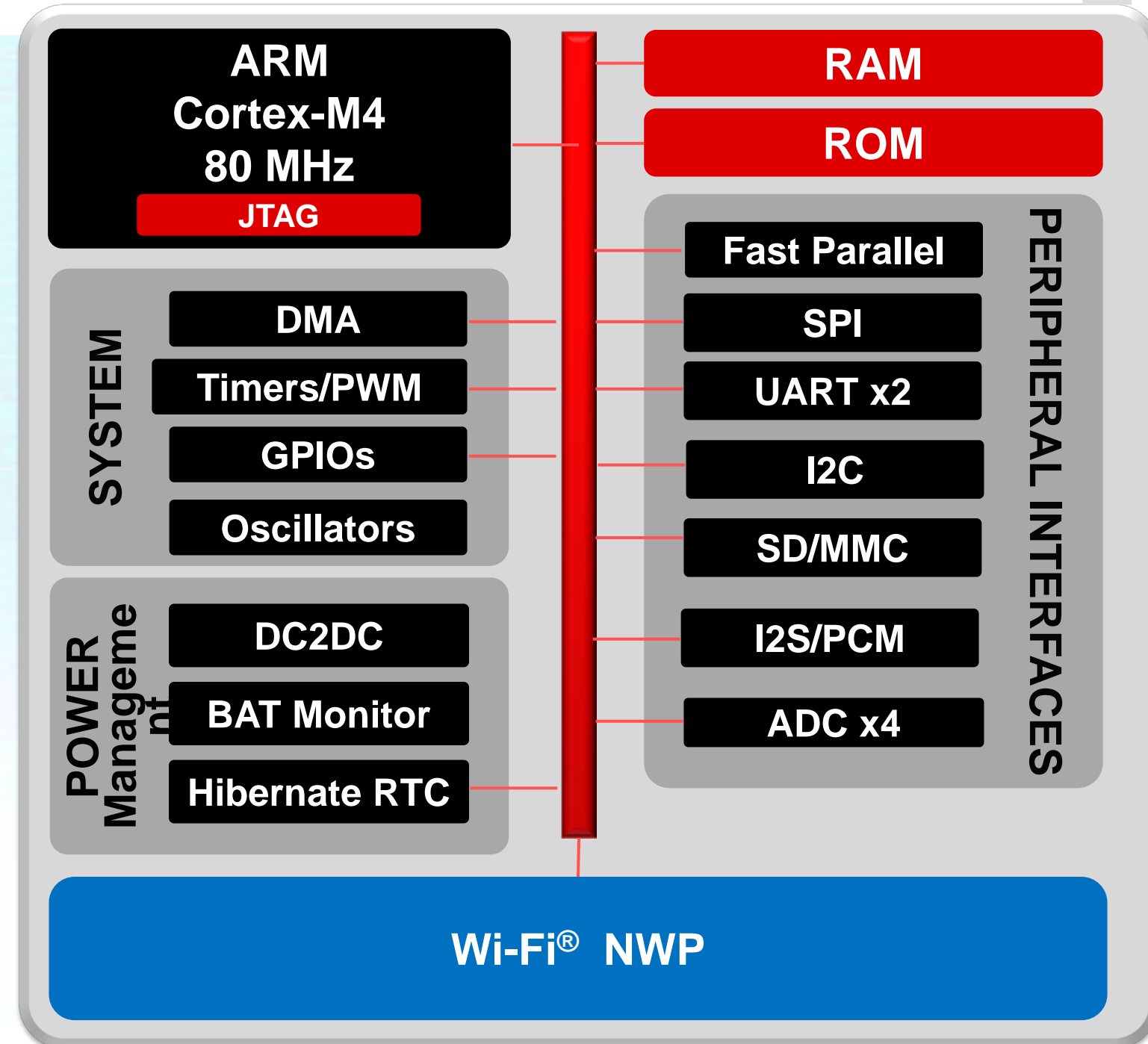
SimpleLink™ CC3100/CC3200 NWP software

- **CC3100 can operate with any MCU including 8/16/32 bit architectures**
- **CC3100/CC3200 Host Driver buildable for both RTOS and bare metal**
- **Station, access point and Wi-Fi Direct® modes**
- **Personal and enterprise security**
- **IPv4 TCP/IP Stack**
- **8 Simultaneous TCP or UDP sockets**
- **2 Simultaneous TLS v1.2 / SSL 3.0 sockets**
- **Small memory foot print on MCU**
  - ➢ **As low as 7 KB code space, 700 B data (MSP430, TCP Client example)**
- **Reference code for multiple TI MCUs provided for IAR and CCS IDEs**
- **MCU simulators for Windows and Linux: SimpleLink Studio**

Customer Application

NetApp | Sockets | WiFi

CC3100 SimpleLink Driver

Bus Driver (SPI or UART) for MCU

MCU or CC3200 M4 Core

Bus Driver (SPI or UART)

Network Apps

TCP/IP Stack

WLAN Security and Management

WLAN MAC & PHY

CC3100 or NWP

Platform Code	TI Code	Customer Code
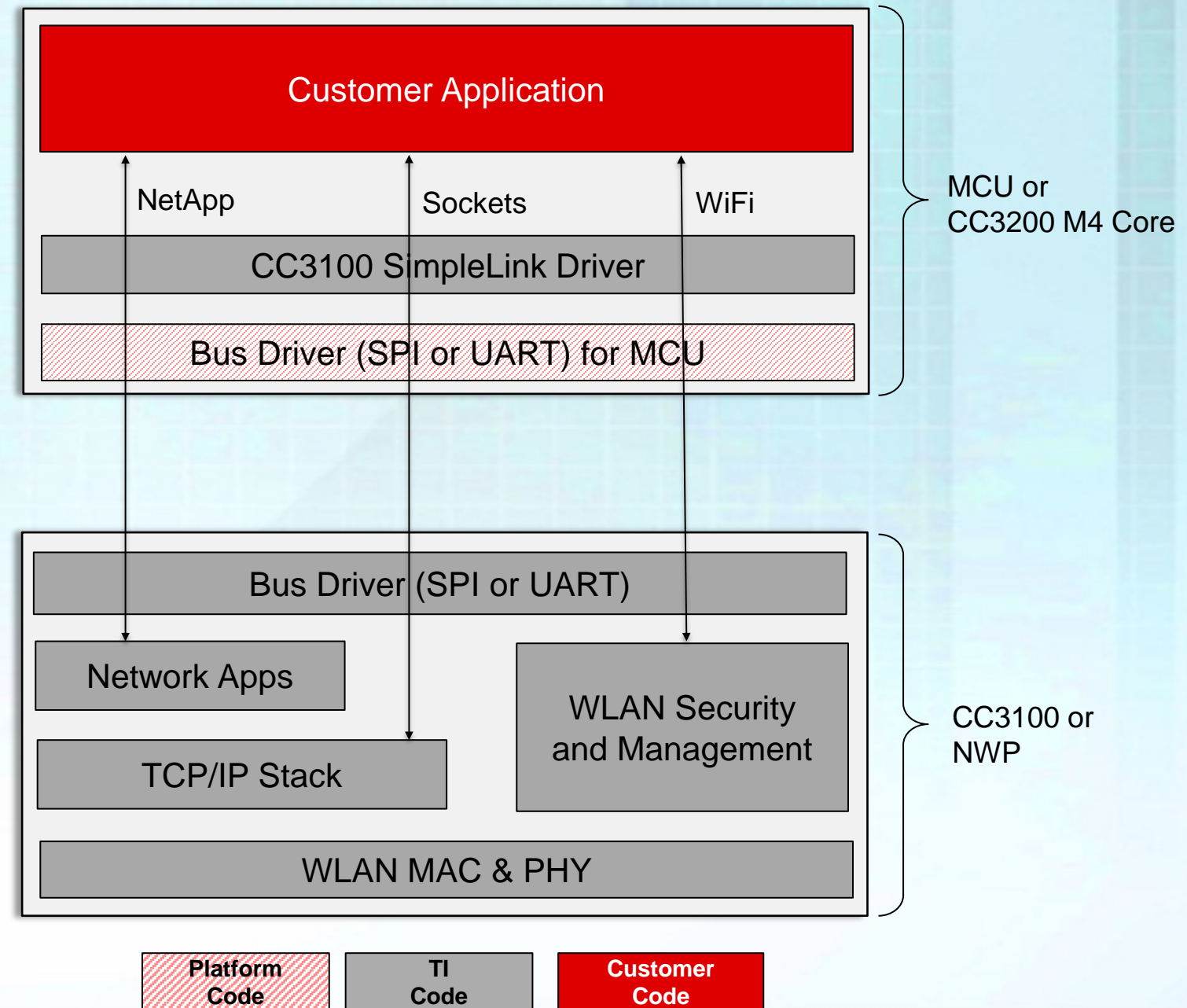
Programming with SimpleLink Wi-Fi

Simple Wi-Fi Control

Examples:

- **Start/Stop network Processor**
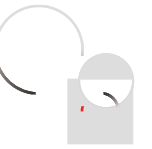 - **sl_Start, sl_Stop**

- **Connect to an Access Point**
  - **sl_WlanConnect()**
  - **(auto-connect on startup: sl_WlanPolicySet(), sl_WlanProfileAdd())**

- **Change mode (Station Access Point, Peer to Peer)**
  - **sl_WlanSetMode()**

TEXAS INSTRUMENTS

Socket Standard

- **BSD Socket API**

  The Berkeley socket interface (also known as the BSD socket API) is an application programming interface (API) to **code applications performing communication between hosts or between processes on one computer, using the concept of an Internet socket**
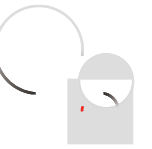
  - It was first developed at the University of California, Berkeley for use on Unix systems
  - All modern operating systems now have some implementation of the Berkeley socket interface, as it became the standard interface for connecting to the Internet.
  - The Berkeley socket API forms the de facto standard abstraction for network sockets

TEXAS INSTRUMENTS
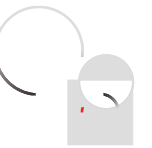
Socket API

BSD Socket API	SimpleLink Socket API
accept()	sl_Accept()
bind()	sl_Bind ()
close()	sl_Close ()
connect()	sl_Connect ()
getbyhostaddr()	
getbyhostname()	sl_NetAppDnsGetHostByName()
	sl_NetAppDnsGetHostByService()
getsockopt()	sl_GetSockOpt ()
listen()	sl_Listen ()
poll()	Same function can be performed by select().
recv()	sl_Recv ()
recvfrom()	sl_RecvFrom ()
select()	sl_Select ()
send()	sl_Send ()
sendto()	sl_SendTo ()
setsockopt()	sl_SetSockOpt ()
socket()	sl_Socket ()

TEXAS INSTRUMENTS

Socket Standard

Simplelink Socket API

- sl_Htonl ()
    - Reverse bytes on 32 bit variable
- sl_Htons ()
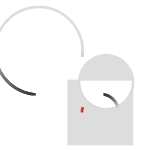   - Reverse bytes on 16 bit variable

BSD Socket API

- poll ()

    Checks socket descriptors for reading, writing, or exceptions.

    Same function can be performed by select().

   Difference is in way parameters are accepted.

TEXAS INSTRUMENTS

CC3200 SDK Examples
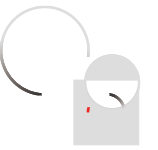
- Audio using I2S interface
- NTP (Network Time Protocol) sync
- HTTP client
- Low power modes
- Provisioning using AP mode
- XMPP
- MQTT
- SMTP
- Secured sockets
- ...and many more

TEXAS INSTRUMENTS

CC3100 SDK Examples
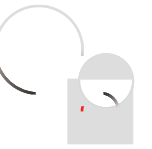
- NTP (Network Time Protocol) sync
- HTTP client
- Provisioning using AP mode
- XMPP
- MQTT
- SMTP
- Secured sockets
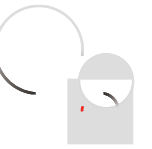- ...and many more

TEXAS INSTRUMENTS
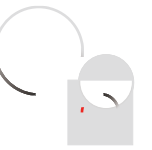
CC3100 Software Porting

Create your own user.h file

- Create a **user.h** file that will include your configurations and adjustments
- Give the names of your functions
- You can use the empty template provided as part of this driver
- You can choose user.h file from one of the wide range of examples applications provided

TEXAS INSTRUMENTS

Define Device Enable/Disable Functions

- The CC3100 enable line (nHib) provides a mechanism to put the device into the minimum current consumption mode

  - sl_DeviceEnable
  - sl_DeviceDisable

TEXAS INSTRUMENTS

Define Serial Interface Functions

- Physical interfaces:
  - SPI
  - UART

- To be generic as possible, all access to the transport layer would be based on the following functions
  - sl_IfOpen
  - sl_IfClose
  - sl_IfRead
  - sl_IfWrite

SimpleLink[3]. Smart. Simple. Slick.

TEXAS INSTRUMENTS

Hand over WLAN Interrupt Control

- The WLAN IRQ line (HOSTINTR) provides a way for the CC3100 device to signal when attention is required from the host.

- User must write an interrupt handler that calls a function supplied by the driver
  - sl_IfRegIntHdlr

- Define functions for enabling and disabling interrupt

TEXAS INSTRUMENTS

Define Event handlers

- The SimpleLink device generates asynchronous events in several situations. In order to catch these events you have to provide handler routines

- Callbacks:
    1. sl_GeneralEvtHdlr
    2. sl_WlanEvtHdlr
    3. sl_NetAppEvtHdlr
    4. sl_SockEvtHdlr

TEXAS INSTRUMENTS

Using SimpleLink Wi-Fi with an RTOS

- If you choose to work in multi-threaded environment under operating system you will have to provide some basic adaptation routines to allow the driver to protect access to resources for different threads (lock object):
    1. osi_LockObjCreate
    2. osi_LockObjDelete
    3. osi_LockObjLock
    4. osi_LockObjUnLock

- In addition, synchronization functions between threads (sync objects):
    1. osi_SyncObjCreate
    2. osi_SyncObjDelete
    3. osi_SyncObjSignal
    4. osi_SyncObjWait
    5. osi_SyncObjClear
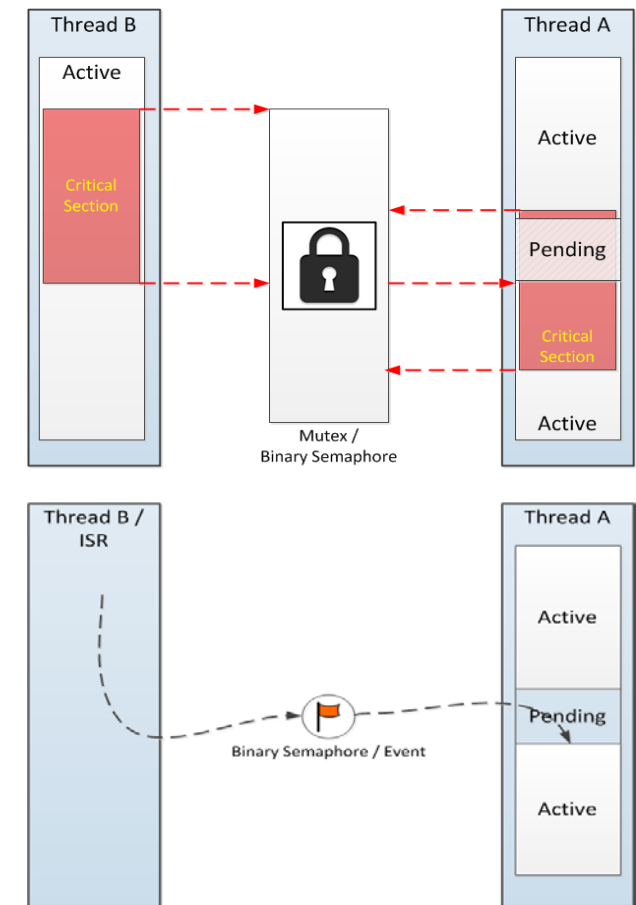
- The SimpleLink driver supports running without dedicated thread allocated solely to the SimpleLink driver. If you choose to work in this mode, you should also supply a spawn method that will enable to run function on a temporary context:
    1. osi_Spawn
    2. osi_Execute

TEXAS INSTRUMENTS

Energia

- Based on the popular Arduino framework
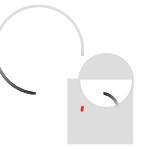 - Same IDE, look, feel, and functionality, only in TI Red

- Supports:
  - CC3200 platforms:
    - CC3200 WiFi LaunchPad (CC3200-LAUNCHXL)
    - RedBearLab CC3200
    - RedBearLab WiFi Mini
  - CC3100 Ported Platforms:
    - MSP430F5529 LaunchPad (MSP-EXP430F5529LP)
    - MSP430FR5969 LaunchPad (MSP-EXP430FR5969)
    - MSP432P401R LaunchPad (MSP-EXP432P401R)
    - TM4C123 LaunchPad (EK-TM4C123GXL)
    - TM4C129 Connected LaunchPad (EK-TM4C1294XL)

TEXAS INSTRUMENTS

SimpleLink + Energia

- **Audience**
  - Engineers from disciplines other than Computer Science who may not be as familiar with the networking needs (Electrical Engineering, Mechanical, BioMedical etc.)
  - Those who are looking to try out a wireless solution for the first time in their application and need to try a prototype before investing in the resources to do it correctly

- **Means**
  - To have a low-cost hardware option with an out of box demo that is under <$50 – (BoosterPack and LaunchPad)
  - To make sure that the drivers and the interfacing with this board is Energia compatible.

TEXAS INSTRUMENTS

Accelerated CC3100 Development: SimpleLink Studio

- SimpleLink Studio is a **PC-based** software that can act as a host controller for the **CC3100**.

- The software communicates with the device over an external USB-SPI bridge using the device's host SPI interface.

- PC-based development offers the following benefits:
  - Fast integration with off-the-shelf examples
  - Friendly environment with good debug capabilities and GUI output
  - The same CC31xx hardware, API and Host driver are used.
  - Software development can start before the MCU or hardware is ready.

TEXAS INSTRUMENTS

SimpleLink™ Wi-Fi Modules: Radio Certified

TEXAS INSTRUMENTS

SimpleLink Wi-Fi: Modules

Key module features

- Includes on module clocks, SPI Flash, and passives
- Connects to an external on-board antenna
- 17.5x20.5 mm Land Grid Array footprint with 1.27mm pitch for low cost PCB design
- Modular FCC, IC, CE & TELEC Certifications to save customer effort, time and money
- CC3100 Wi-Fi network processor and CC3200 wireless MCU pin compatible variants
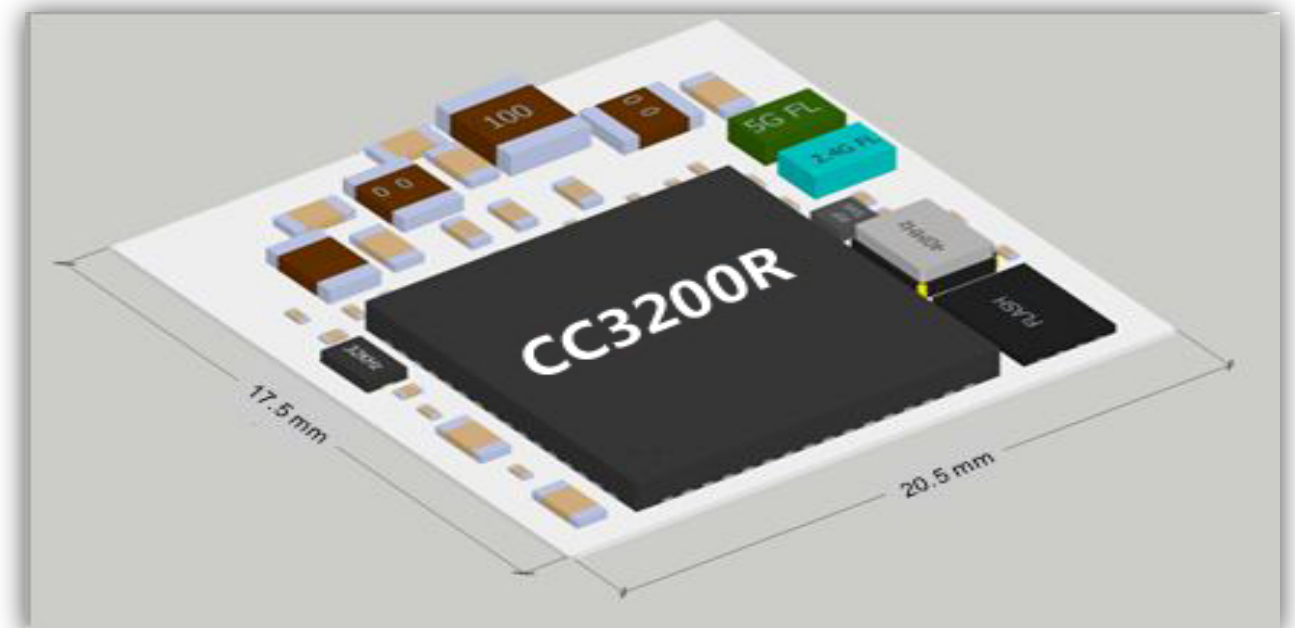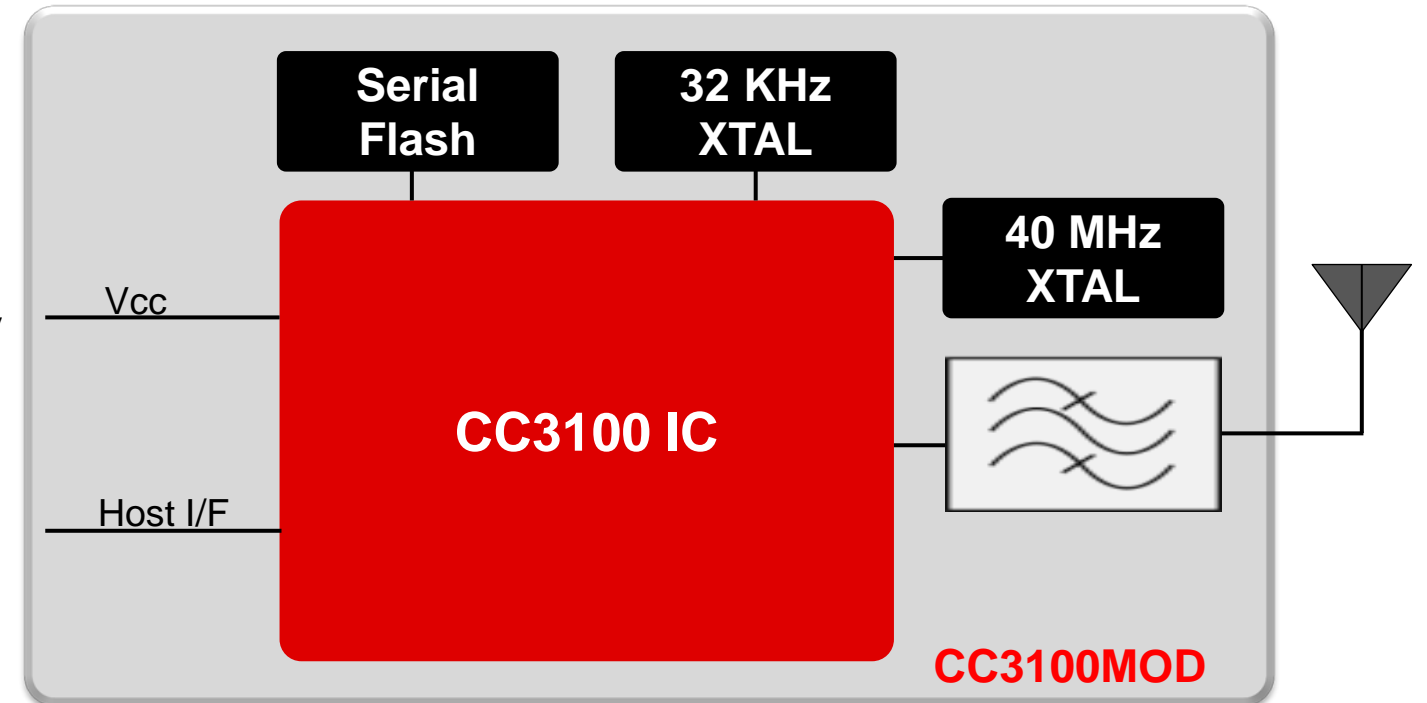
Resources

- **Hardware Design**
  - **CC3200 module TI Design**
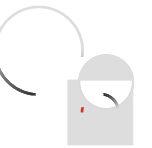 - **CC3100 module TI Design**
- **Software – same as for QFN Device**
  - **CC3200 SDK & Firmware**
  - **CC3100 SDK & Firmware**
- **Evaluation Tools and Support**
  - Module LaunchPad CC3200MODLAUNCHXL - $59.99
  - Module BoosterPack CC3100MODBOOST - $49.99
  - CC3100MODBOOST-CC31XXEMUBOOST - $71
  - CC3100MODBOOST-CC31XXEMUBOOST-MSP-EXP430FR5969 - $86.99
  - E2E Support Forum

TEXAS INSTRUMENTS
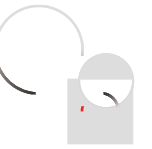
CC3100/3200 Module Package Layout

TOP View

Bottom View

Side View

TEXAS INSTRUMENTS

Certifications & Compliance

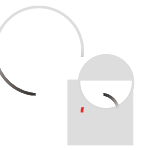|	
FC	• Certified for United States • Tests reports recognized by other countries for filing
Industry Canada	• Certified for Canada • Accepts FCC test reports for filing certifications
C E	• Certified for Europe • ETSI testing is recognized by 40+ countries for filing
TELEC	• Certified for Japan
SRRC	• Certified for People's Republic of China

- FCC & ETSI reports can be used with filing for 40+ other countries
  - Paperwork Exercise
  - In-country Fees
- CE Radio approval covered by ETSI EN300-328 radio test.

TEXAS INSTRUMENTS

FCC Certified Radio Modules & Host End Products

- The TI CC3100/CC3200MOD are FCC certified radio modules that carry a "Modular" grant
- Certified radio modules complies to the "Intentional Radiator" portion (Part 15c) for FCC certification
  - Part 15.247 Transmitter tests
- "Modular" certified radio modules are allowed for integration into multiple host end products by the FCC
- Host end products can use the FCC ID of the certified module as the FCC ID of the host end product
- A label displaying the module's FCC ID must be affixed and visible on the host end product for approval
- FCC IDs are required for host end products with *radio transmitters*
- The manufacturer of the host end products are still responsible for any additional testing covered by the Class of the product. Device Class A and B.
- More information can be found on the certification website for CC3100 & CC3200

TEXAS INSTRUMENTS

CC3100/CC3200 Module Certification Summary

Save substantial costs and time using TI's FCC ID and modular certifications

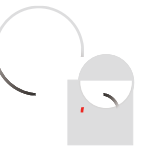**TI's FCC/ETSI test reports can be used to file for certifications with 40+ other countries**

No Part 15.247 radio testing required to obtain FCC/IC certifications

- Save 1-2 months of reporting and filing
- Save upfront certification (~$30k) and RF design resources (~$10-15K contracted)
- No risk of testing failure, which is common without RF expertise resources
- Less paperwork and simpler application process for full certification

Design has an external antenna, but is still certified

More information can be found on the
certification website for CC3100 & CC3200

TEXAS INSTRUMENTS

TI CC3100/CC3200MOD FCC Certification Advantages
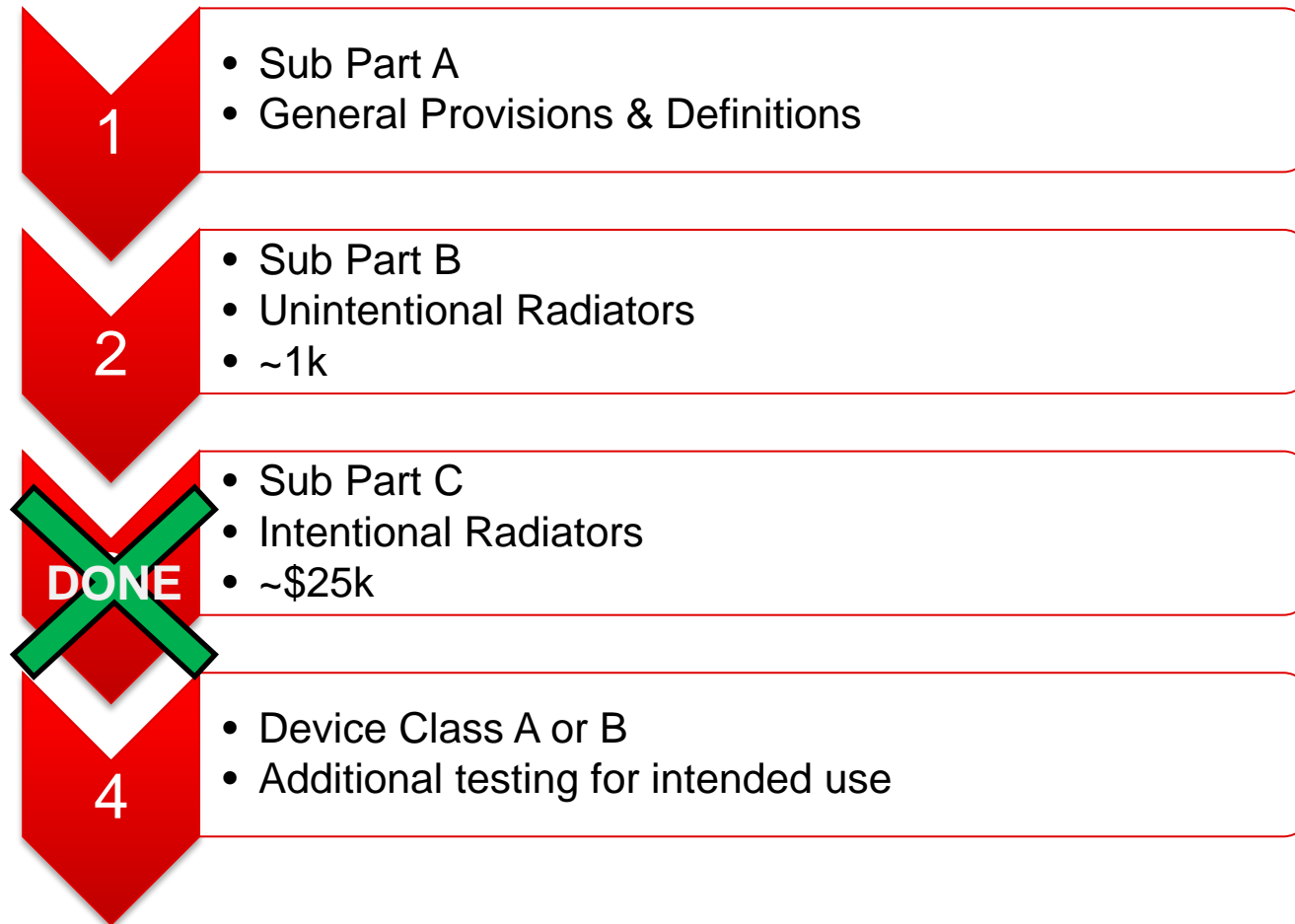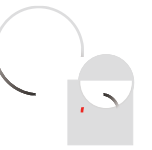
- No Part 15 Radio tests when using the TI module
  - Specifically Part 15.247
  - Typically ~ 1-2mo and ~$30K for testing, reporting, and filing

- Part 15.247 Tests
  - AC Power Conducted Emissions
  - Radiated Emissions
  - Band Edge Measurements
  - 6dB bandwidth
  - Conducted Power
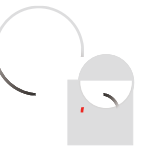 - Power Spectral Density
  - Meeting Antenna Requirements

TEXAS INSTRUMENTS

FCC Part 15 Cert. Process/Flow

1
- Sub Part A
- General Provisions & Definitions

2
- Sub Part B
- Unintentional Radiators
- ~1k

DONE
- Sub Part C
- Intentional Radiators
- ~$25k

4
- Device Class A or B
- Additional testing for intended use

- Host end product type. Additional testing may be required
  - Class A Digital Device for use in a commercial, industrial or business environment.
  - Class B Digital Device for use in a residential environment notwithstanding use in commercial, business and industrial environments.

TEXAS INSTRUMENTS

Evaluation Boards, Tools, Software Kits

TEXAS INSTRUMENTS
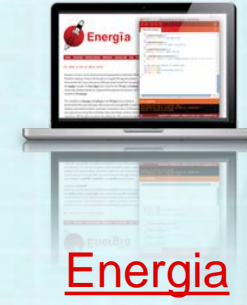
Tools

IDEs

CCS

IAR

GCC
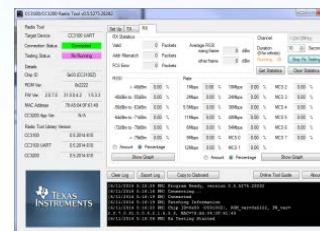
Energia

Microsoft Visual Studio

SimpleLink Wi-Fi Specific Tools

Flashing/ Programing Tool: Uniflash

Pin Muxing Tool

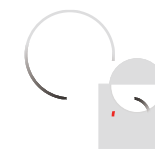Software Development Kit (SDK)

Radiotool

SimpleLink Studio

Wi-Fi Starter App

TEXAS INSTRUMENTS

CC3100 and CC3200 kits

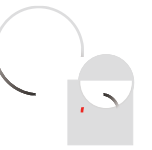| Platform	Kits & Bundles
CC3200 Industry's first single-chip Wi-Fi solution with user-dedicated programmable microcontroller (MCU)	Kits • NEW Module LaunchPad CC3200MODLAUNCHXL • QFN Device LaunchPad CC3200-LAUNCHXL
CC3100 Internet-on-a-chip™ solution Connect any MCU to the Internet of Things	Kits • NEW Module BoosterPack CC3100MODBOOST • QFN Device BoosterPack CC3100BOOST • BOOST required to Flash CC3100 - CC31XXEMUBOOST Bundles are also available on www.ti.com

LaunchPad   Module LaunchPad   Boost + Emulator   MODBoost + Emulator   Stand Alone Emulator

TEXAS INSTRUMENTS
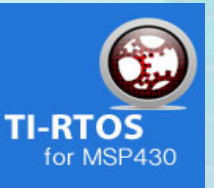
Support: Software, Online Content and More

Software

Software for CC3100
- Easy to use API
- Network security made easy
- Demos for internet of things applications

Software for CC3200
All capabilities of the CC3100 plus
- Examples for connections to peripherals and sensors
- Embedded RTOS support (FreeRTOS, TI RTOS)

RTOS

TI-RTOS for MSP430

Support

Wiki

Development documentation, user guides, software documents, test/validation

E2E online support

TI E2E™ community – answers at your fingertips from engineers

TI.com/simplelinkwifi

Datasheets, kits, sample orders, software, product selection

And more…

Training
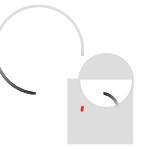Online videos and other resources to learn more about the parts and tools

TIDesigns
TI reference designs online

TIstore 24/7

Silicon & kit sales & samples on TI Store

TEXAS INSTRUMENTS

SimpleLink™ Wi-Fi® Key Resources

- TI Landing page - http://www.ti.com/simplelinkwifi
  - Product information, feature/benefit, applications, getting started, tools & software, ecosystem (cloud) & support/community

- TI Wiki – http://processors.wiki.ti.com/index.php/CC31xx_&_CC32xx Organize information for Getting started, Hardware details, Software details including porting information, Test/Certification and Support and Community

- How to Get Started

- Product Pages
  - www.ti.com/product/CC3100 – datasheet, key documents, kits, software
  - www.ti.com/product/CC3200 - datasheet, key documents, kits, software

- E2E Support Forum

TEXAS INSTRUMENTS