# JORJIN TECHNOLOGIES

## Boosting Your Creativity with One IOT Partner

# 20 Years of Revolution

1997

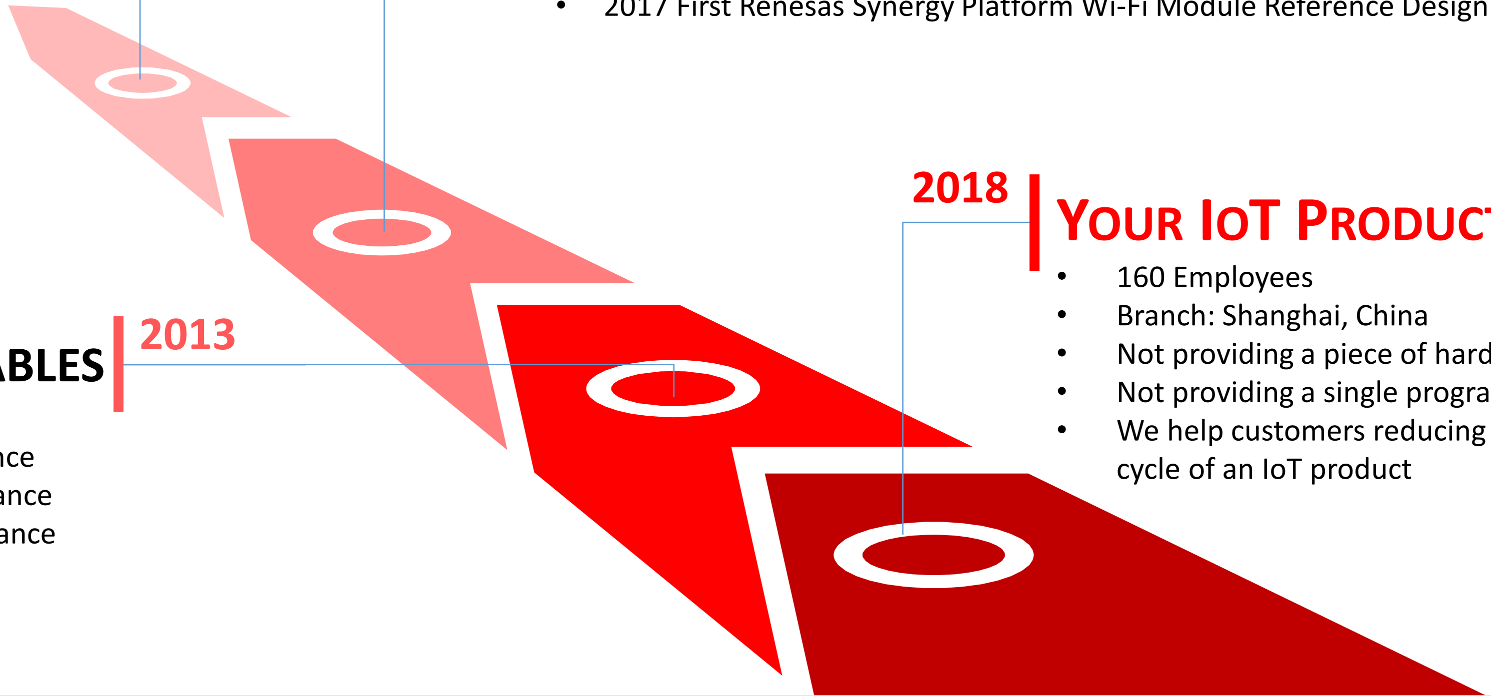
## COMPONENTS

- 4 Employees
- Founded by Tom Liang
- Started as a TriQuint (Qorvo) Agent

2007

## WIRELESS CONNECTIVITY MODULES

- 2011 Amazon Kindle Fire Design-Win with TI WiLink 6-Based Module
- 2011 TI AM/DM37 Application Processor (AP) Module
- 2012 TI OMAP4460/4470 AP Module Design
- 2013 First Appearance of TI WiLink 8 Modules
- 2015 First Cortex-A5 AP Module with SiP Technique
- 2017 First TI Bluetooth 5 Module Solution Appearance
- 2017 First Qualcomm Atheros 2T2R 802.11 ac Module Solution Appearance
- 2017 First Sigfox Certified Module Solution Appearance
- 2017 First Renesas Synergy Platform Wi-Fi Module Reference Design Collaboration



2013

## WEARABLES

- 2013 First Smart Glasses Reference Design
- 2015 First Jorjin Smart Glasses Module Appearance
- 2016 First Jorjin Glasses Kit (Monocular) Appearance
- 2017 First Jorjin Binocular Smart Glasses Appearance
- 2018 J-Reality Was Nominated for MWC's Best Connected Consumer Electronic Device

2018

## YOUR IOT PRODUCT PARTNER

- 160 Employees
- Branch: Shanghai, China
- Not providing a piece of hardware only
- Not providing a single program/driver only
- We help customers reducing the development cycle of an IoT product

# Wireless Module Solution Expertise

## Service

- PCBA layout review for RF performance
- Antenna matching review and sales
- PCBA design for IoT product

## Cloud

- IoT cloud consulting
- Expert in cloud platforms and IoT applications
- Supporting major SaaS platforms

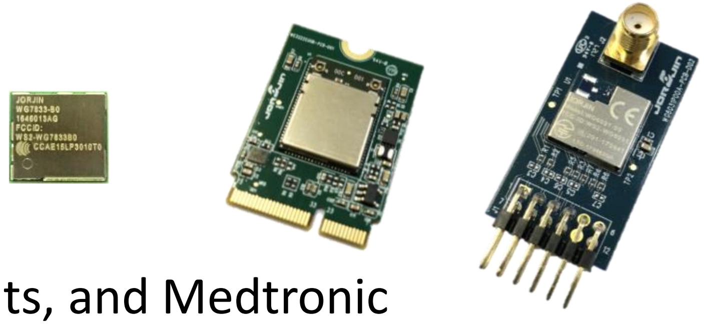
## Software

- MCU driver porting
- MPU driver porting
- Firmware development
- Cloud connection establishment
- Product line test program development
- Characterization test setup

## Hardware

- Wi-Fi & BT/LE Combo
- Wi-Fi only
- IoT Wi-Fi (SoC)
- Bluetooth 5
- Sub-1GHz (Sigfox)

# Wireless Module Expertise



## High volume design & production capability

- More than 10-Year of module design & manufacturing experience
- Shipped out over 6KK units of modules with quality in 2017
- Audited & approved by tier-1 clientele such as Quanta, Texas Instruments, and Medtronic
- Partnership with major silicon companies:
  - Qualcomm, Realtek, Renesas, STMicroelectronics, and Texas Instruments

## Experience on major platforms with technical support capability

### MICROPROCESSOR

- TI OMAP™ 4 Platform
- TI Sitara™ AM335x
- TI DaVinci Digital Media Processor DM368
- TI DaVinci Digital Media Processor DM385
- NXP® i.MX 6 Series
- NXP® i.MX 7 Series
- NVIDIA® TEGRA™ K1
- NVIDIA® TEGRA™ 4
- Qualcomm® Snapdragon 820
- Renesas RZ/G
- Renesas RZ/A

### MICROCONTROLLER

- TI MSP432™ MCU
- STM32™ Family
- Renesas Synergy™ S1, S3, S5, and S7

### OPERATING SYSTEM

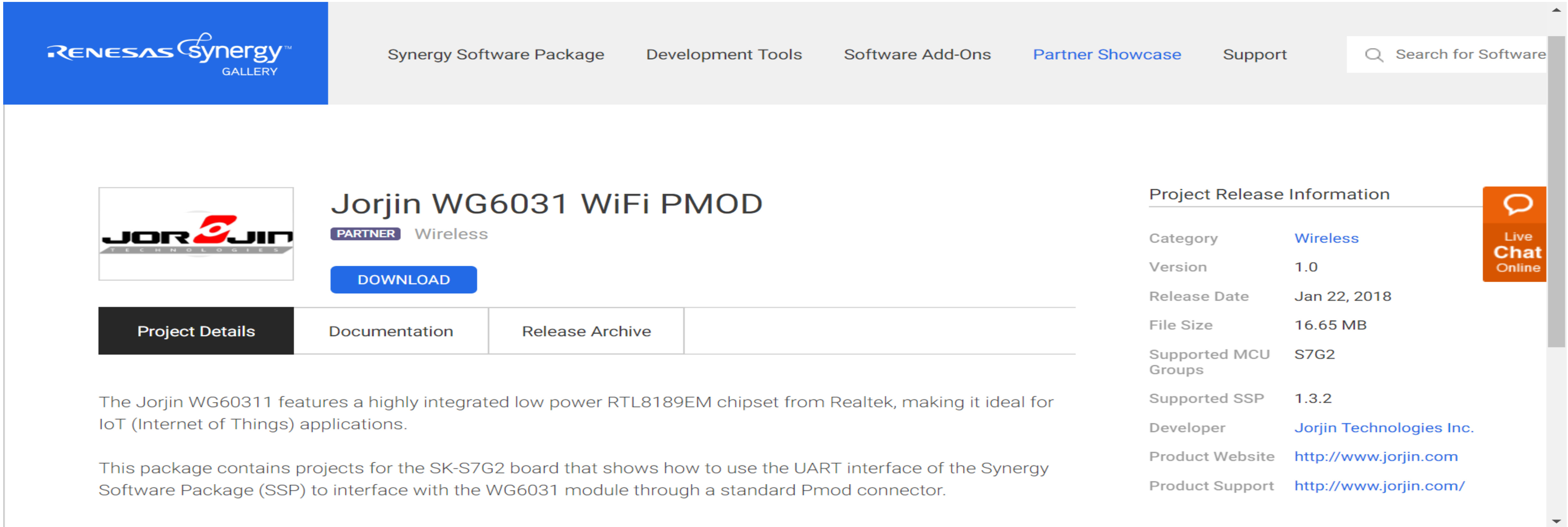
- Android™ 4.2
- Android™ 4.3
- Android™ 4.4
- Android™ 5.0
- Android™ 6.0
- Android™ 7.0
- Microsoft Windows 7
- Microsoft Windows 8
- Microsoft Windows 10
- Linux® 2.6.37 – 4.9

### REAL-TIME OPERATING SYSTEM

- TI-RTOS
- FreeRTOS™
- THREADX

# Renesas Recommended Partner

- https://synergygallery.renesas.com/auth/login



## Jorjin WG6031 WiFi PMOD

Wireless

The Jorjin WG60311 features a highly integrated low power RTL8189EM chipset from Realtek, making it ideal for IoT (Internet of Things) applications.

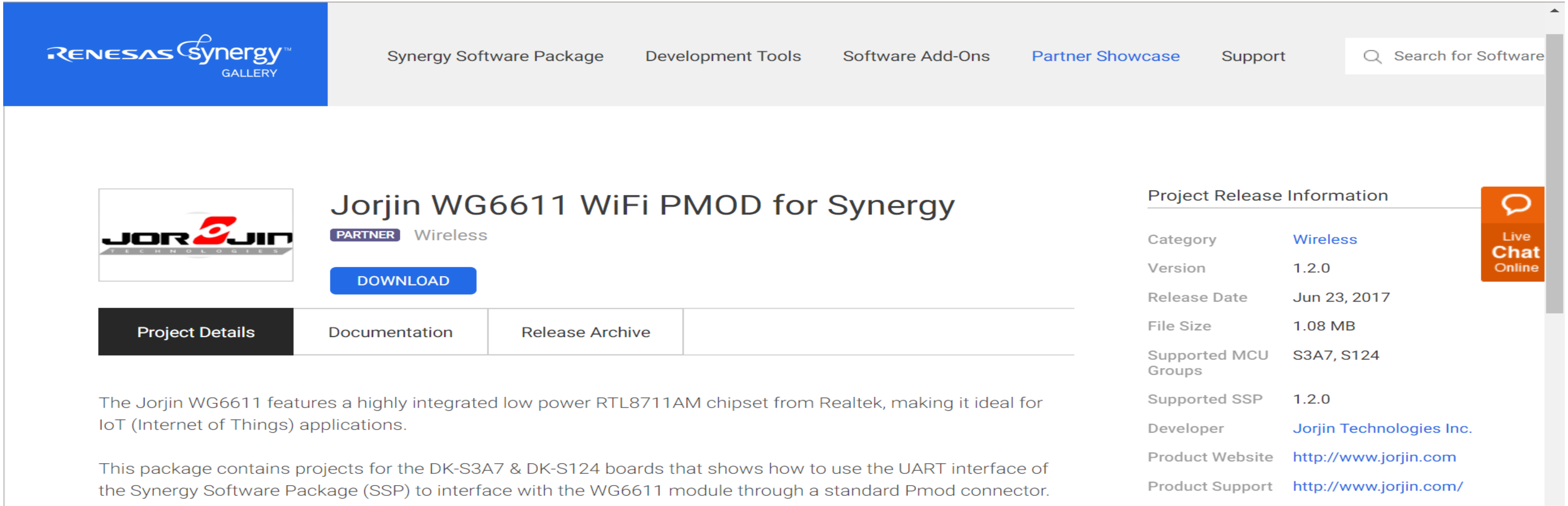
This package contains projects for the SK-S7G2 board that shows how to use the UART interface of the Synergy Software Package (SSP) to interface with the WG6031 module through a standard Pmod connector.

Project Release Information

| | |
|---|---|
| Category | Wireless |
| Version | 1.0 |
| Release Date | Jan 22, 2018 |
| File Size | 16.65 MB |
| Supported MCU Groups | S7G2 |
| Supported SSP | 1.3.2 |
| Developer | Jorjin Technologies Inc. |
| Product Website | http://www.jorjin.com |
| Product Support | http://www.jorjin.com/ |

# Renesas Recommended Partner

- https://synergygallery.renesas.com/auth/login



## Jorjin WG6611 WiFi PMOD for Synergy

The Jorjin WG6611 features a highly integrated low power RTL8711AM chipset from Realtek, making it ideal for IoT (Internet of Things) applications.

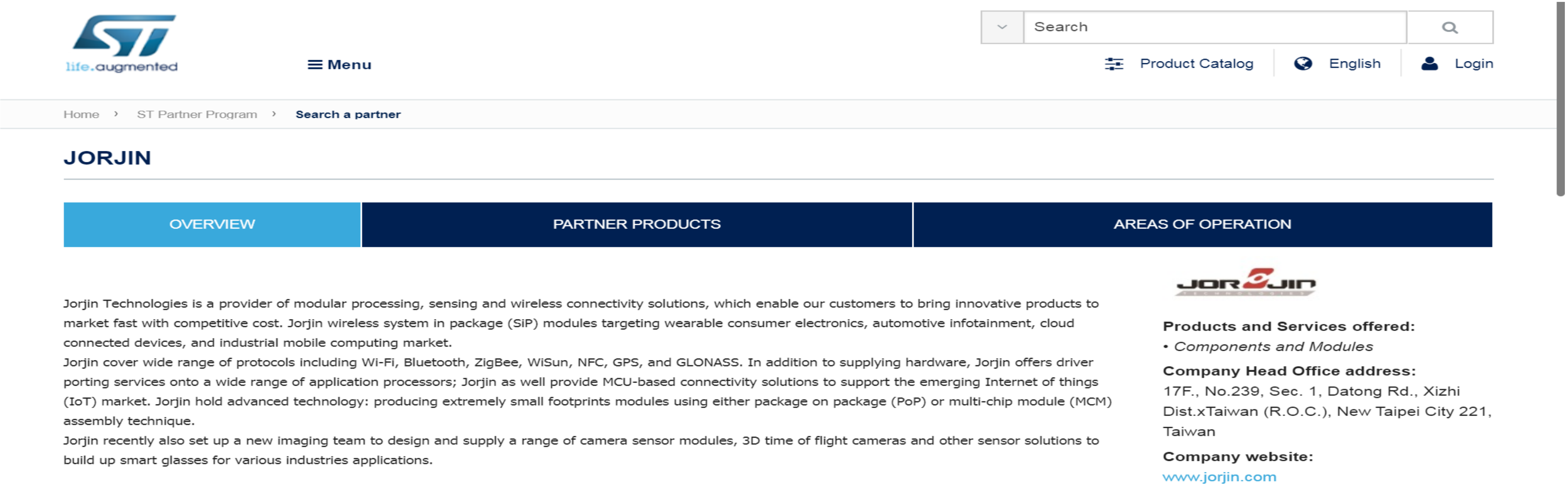
This package contains projects for the DK-S3A7 & DK-S124 boards that shows how to use the UART interface of the Synergy Software Package (SSP) to interface with the WG6611 module through a standard Pmod connector.

Project Release Information

| | |
|---|---|
| Category | Wireless |
| Version | 1.2.0 |
| Release Date | Jun 23, 2017 |
| File Size | 1.08 MB |
| Supported MCU Groups | S3A7, S124 |
| Supported SSP | 1.2.0 |
| Developer | Jorjin Technologies Inc. |
| Product Website | http://www.jorjin.com |
| Product Support | http://www.jorjin.com/ |

# STM Partner: 1st Technology Qualified Partner(TQP) in Taiwan

- http://www.st.com/content/st_com/en/partner/partner-program/partnerpage/JORJIN.html



**JORJIN**

Jorjin Technologies is a provider of modular processing, sensing and wireless connectivity solutions, which enable our customers to bring innovative products to market fast with competitive cost. Jorjin wireless system in package (SiP) modules targeting wearable consumer electronics, automotive infotainment, cloud connected devices, and industrial mobile computing market.

Jorjin cover wide range of protocols including Wi-Fi, Bluetooth, ZigBee, WiSun, NFC, GPS, and GLONASS. In addition to supplying hardware, Jorjin offers driver porting services onto a wide range of application processors; Jorjin as well provide MCU-based connectivity solutions to support the emerging Internet of things (IoT) market. Jorjin hold advanced technology: producing extremely small footprints modules using either package on package (PoP) or multi-chip module (MCM) assembly technique.

Jorjin recently also set up a new imaging team to design and supply a range of camera sensor modules, 3D time of flight cameras and other sensor solutions to build up smart glasses for various industries applications.

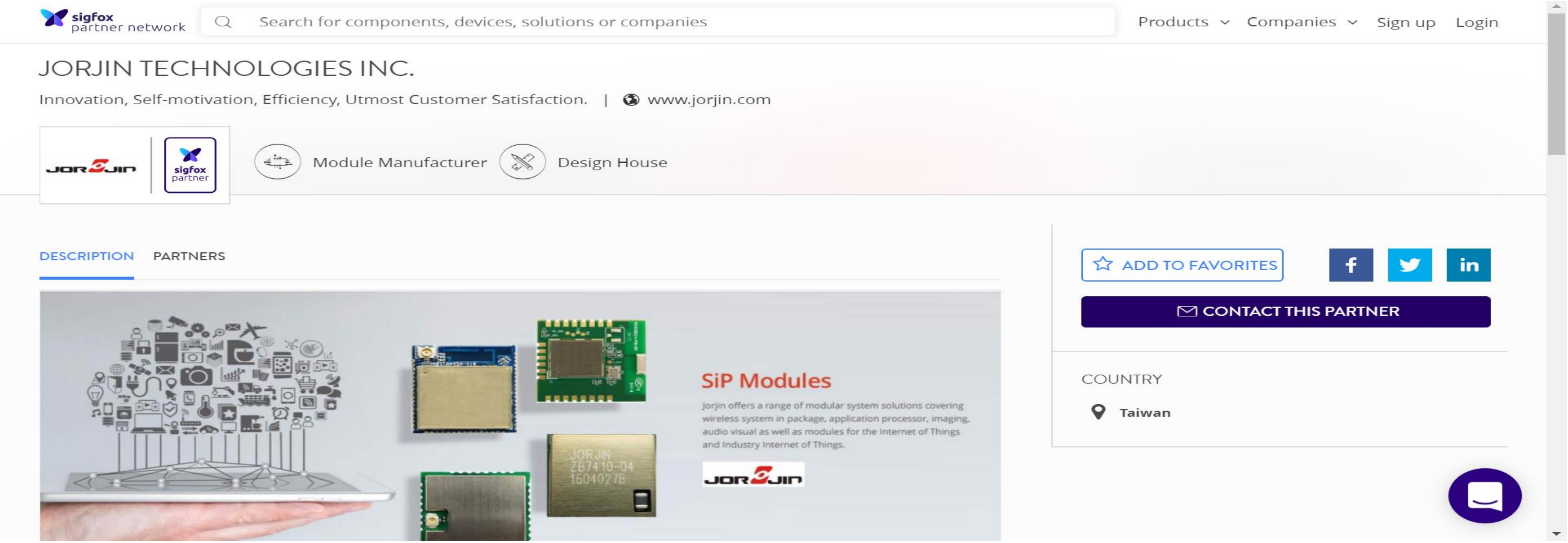
**Products and Services offered:**
- *Components and Modules*

**Company Head Office address:**
17F., No.239, Sec. 1, Datong Rd., Xizhi Dist.xTaiwan (R.O.C.), New Taipei City 221, Taiwan

**Company website:**
www.jorjin.com

# Sigfox Recommended Partner

https://partners.sigfox.com/companies/jorjin-technologies-inc.



JORJIN TECHNOLOGIES INC.

Innovation, Self-motivation, Efficiency, Utmost Customer Satisfaction. | www.jorjin.com

Module Manufacturer

Design House

COUNTRY

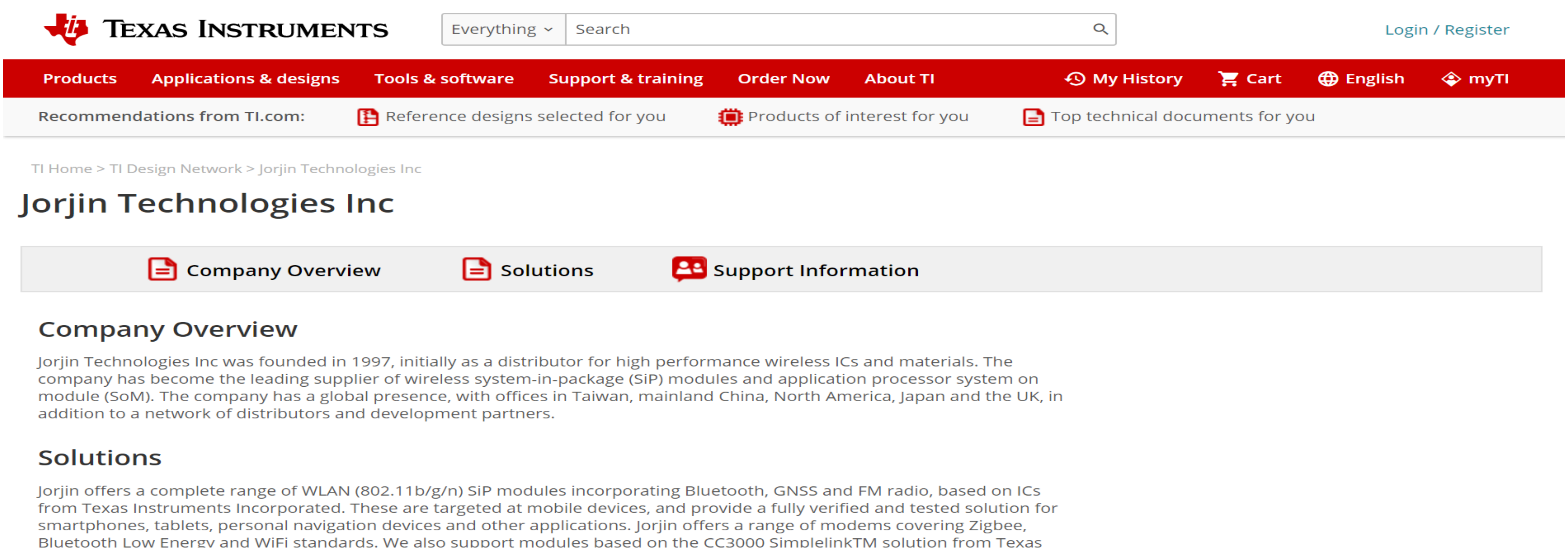
Taiwan

SiP Modules

Jorjin offers a range of modular system solutions covering wireless system in package, application processor, imaging, audio visual as well as modules for the Internet of Things and Industry Internet of Things.

# TI Recommended Partner

- [http://www.ti.com/devnet/docs/catalog/companyfolder.tsp?actionPerformed=companyFolder&companyId=8118](http://www.ti.com/devnet/docs/catalog/companyfolder.tsp?actionPerformed=companyFolder&companyId=8118)



## Jorjin Technologies Inc

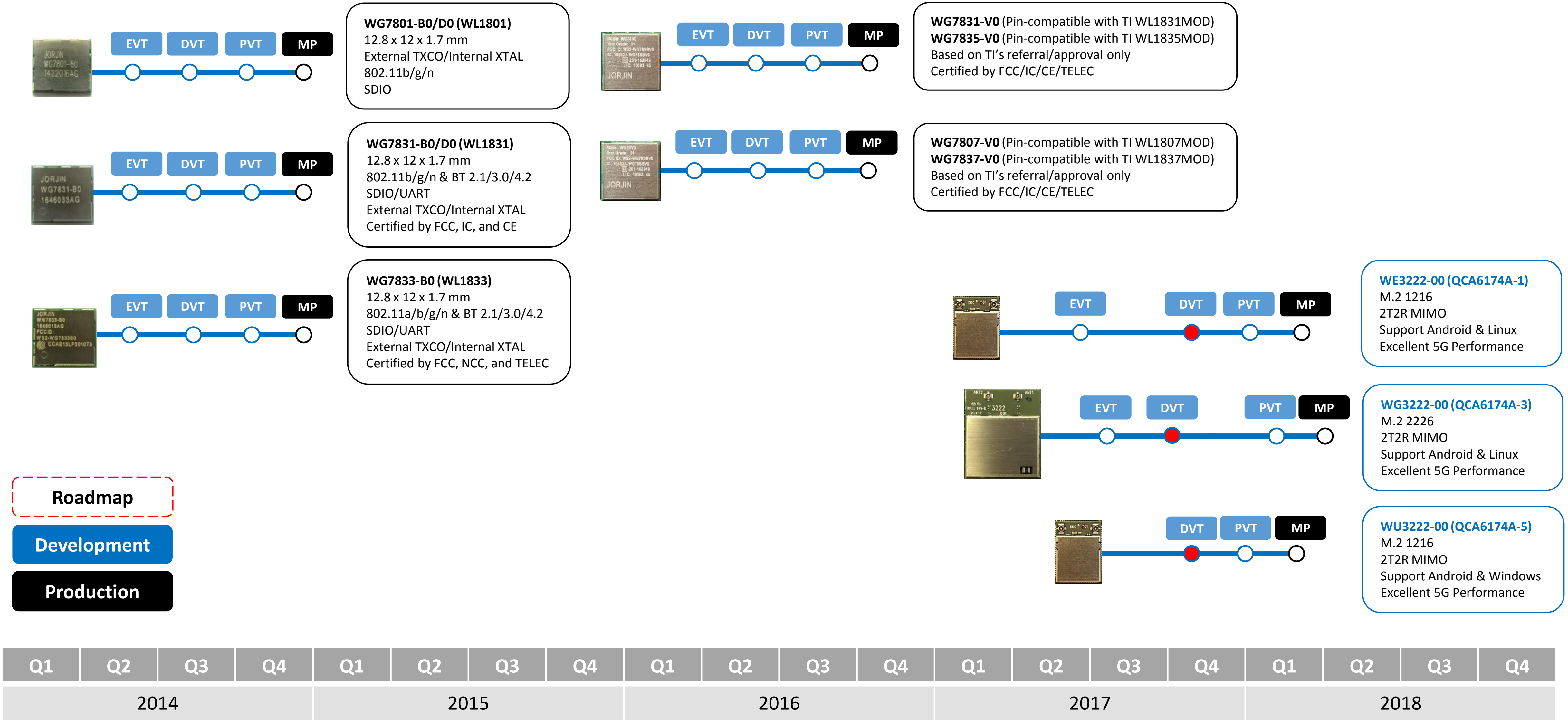
### Company Overview

Jorjin Technologies Inc was founded in 1997, initially as a distributor for high performance wireless ICs and materials. The company has become the leading supplier of wireless system-in-package (SiP) modules and application processor system on module (SoM). The company has a global presence, with offices in Taiwan, mainland China, North America, Japan and the UK, in addition to a network of distributors and development partners.

### Solutions

Jorjin offers a complete range of WLAN (802.11b/g/n) SiP modules incorporating Bluetooth, GNSS and FM radio, based on ICs from Texas Instruments Incorporated. These are targeted at mobile devices, and provide a fully verified and tested solution for smartphones, tablets, personal navigation devices and other applications. Jorjin offers a range of modems covering Zigbee, Bluetooth Low Energy and WiFi standards. We also support modules based on the CC3000 SimplelinkTM solution from Texas

# Wireless Connectivity Module Roadmap – Industrial



**WG7801-B0/D0 (WL1801)**
12.8 x 12 x 1.7 mm
External TXCO/Internal XTAL
802.11b/g/n
SDIO

**WG7831-B0/D0 (WL1831)**
12.8 x 12 x 1.7 mm
802.11b/g/n & BT 2.1/3.0/4.2
SDIO/UART
External TXCO/Internal XTAL
Certified by FCC, IC, and CE

**WG7833-B0 (WL1833)**
12.8 x 12 x 1.7 mm
802.11a/b/g/n & BT 2.1/3.0/4.2
SDIO/UART
External TXCO/Internal XTAL
Certified by FCC, NCC, and TELEC

**WG7831-V0** (Pin-compatible with TI WL1831MOD)
**WG7835-V0** (Pin-compatible with TI WL1835MOD)
Based on TI's referral/approval only
Certified by FCC/IC/CE/TELEC

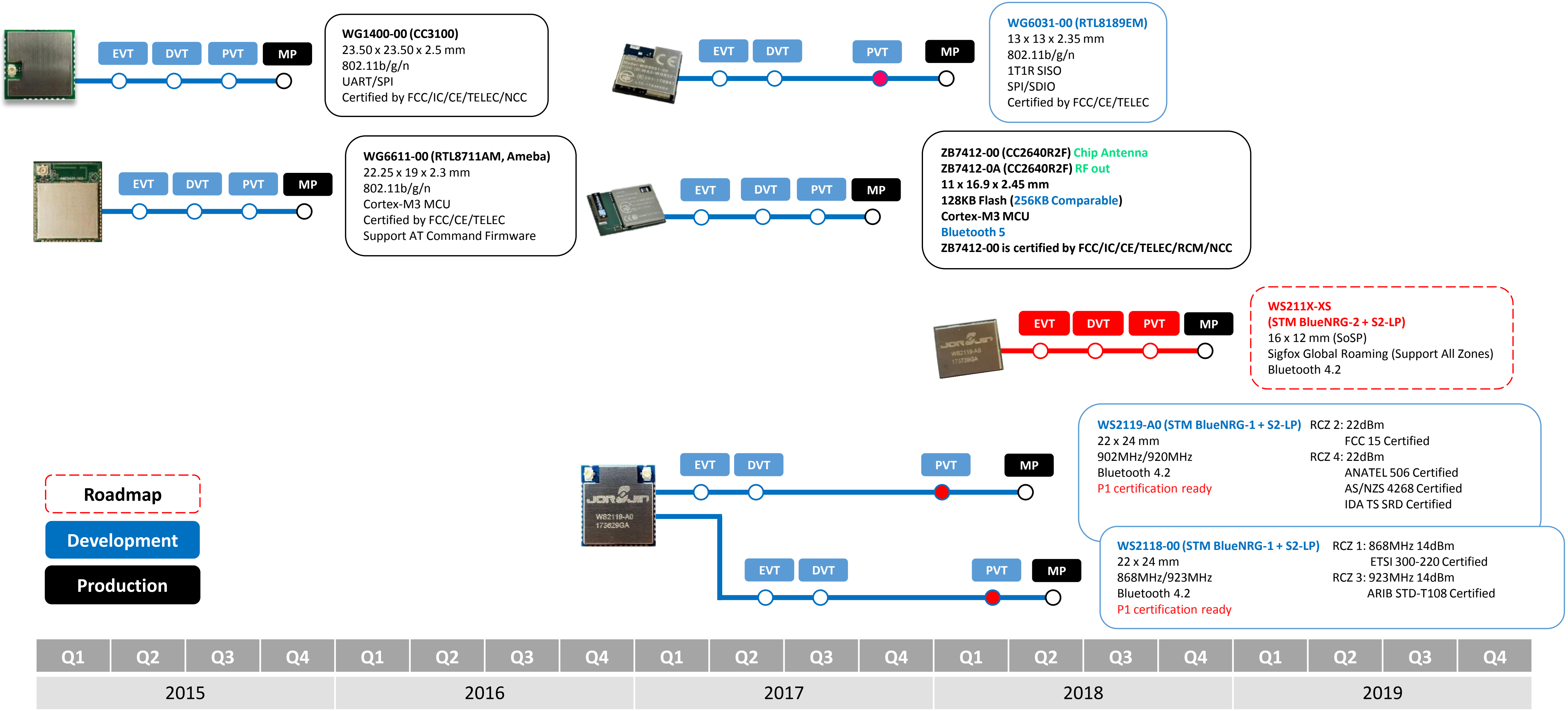
**WG7807-V0** (Pin-compatible with TI WL1807MOD)
**WG7837-V0** (Pin-compatible with TI WL1837MOD)
Based on TI's referral/approval only
Certified by FCC/IC/CE/TELEC

**WE3222-00 (QCA6174A-1)**
M.2 1216
2T2R MIMO
Support Android & Linux
Excellent 5G Performance

**WG3222-00 (QCA6174A-3)**
M.2 2226
2T2R MIMO
Support Android & Linux
Excellent 5G Performance

**WU3222-00 (QCA6174A-5)**
M.2 1216
2T2R MIMO
Support Android & Windows
Excellent 5G Performance

# Wireless Connectivity Module Roadmap – IoT



**WG1400-00 (CC3100)**
23.50 x 23.50 x 2.5 mm
802.11b/g/n
UART/SPI
Certified by FCC/IC/CE/TELEC/NCC

**WG6611-00 (RTL8711AM, Ameba)**
22.25 x 19 x 2.3 mm
802.11b/g/n
Cortex-M3 MCU
Certified by FCC/CE/TELEC
Support AT Command Firmware

**WG6031-00 (RTL8189EM)**
13 x 13 x 2.35 mm
802.11b/g/n
1T1R SISO
SPI/SDIO
Certified by FCC/CE/TELEC

**ZB7412-00 (CC2640R2F) Chip Antenna**
**ZB7412-0A (CC2640R2F) RF out**
**11 x 16.9 x 2.45 mm**
**128KB Flash (256KB Comparable)**
**Cortex-M3 MCU**
**Bluetooth 5**
**ZB7412-00 is certified by FCC/IC/CE/TELEC/RCM/NCC**

**WS211X-XS**
**(STM BlueNRG-2 + S2-LP)**
16 x 12 mm (SoSP)
Sigfox Global Roaming (Support All Zones)
Bluetooth 4.2

**WS2119-A0 (STM BlueNRG-1 + S2-LP)**
22 x 24 mm
902MHz/920MHz
Bluetooth 4.2
P1 certification ready

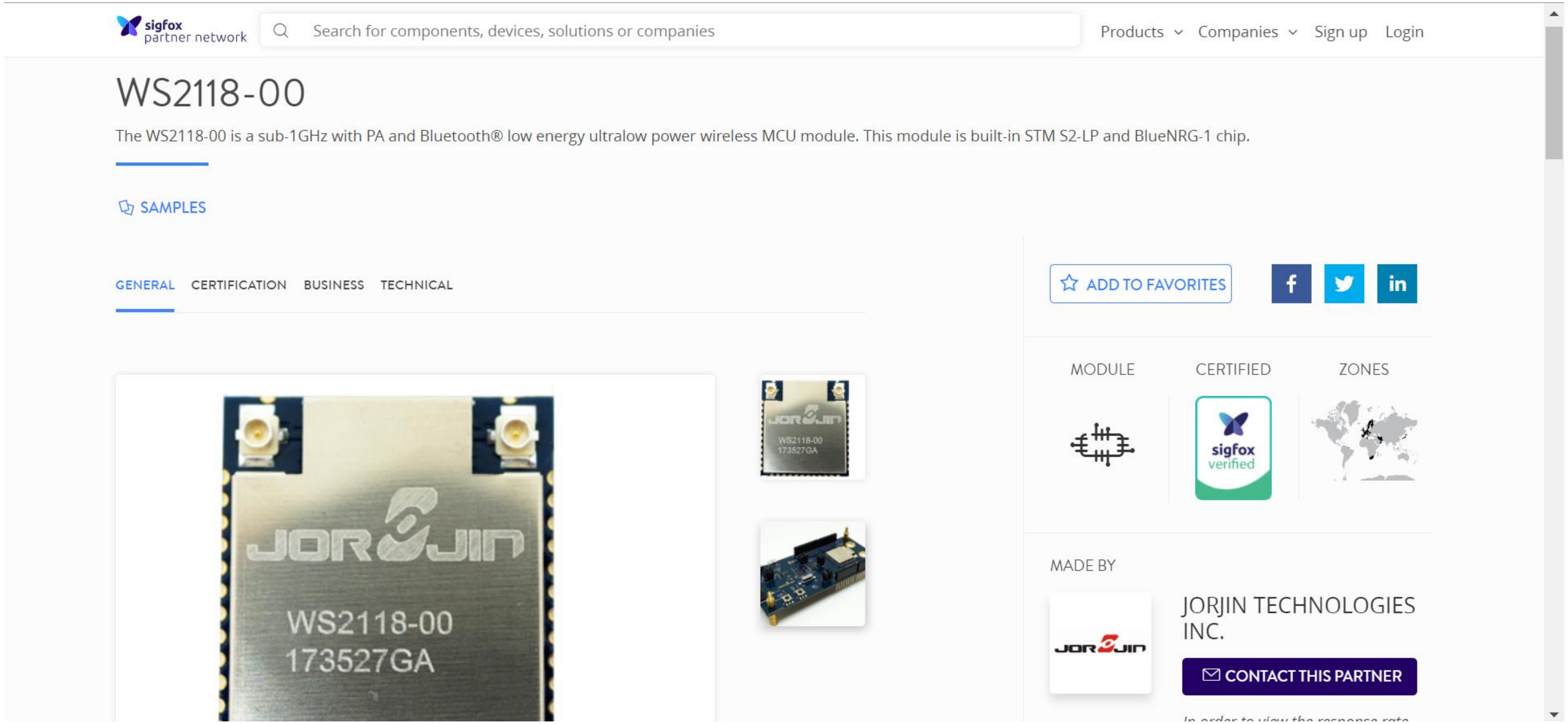
RCZ 2: 22dBm
FCC 15 Certified
RCZ 4: 22dBm
ANATEL 506 Certified
AS/NZS 4268 Certified
IDA TS SRD Certified

**WS2118-00 (STM BlueNRG-1 + S2-LP)**
22 x 24 mm
868MHz/923MHz
Bluetooth 4.2
P1 certification ready

RCZ 1: 868MHz 14dBm
ETSI 300-220 Certified
RCZ 3: 923MHz 14dBm
ARIB STD-T108 Certified

**Roadmap**
**Development**
**Production**

# P1 Cert. for Jorjin's WS2118(RCZ1)



sigfox partner network

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## WS2118-00

The WS2118-00 is a sub-1GHz with PA and Bluetooth® low energy ultralow power wireless MCU module. This module is built-in STM S2-LP and BlueNRG-1 chip.

SAMPLES

GENERAL CERTIFICATION BUSINESS TECHNICAL

☆ ADD TO FAVORITES

MODULE CERTIFIED ZONES

sigfox verified

WS2118-00
173527GA

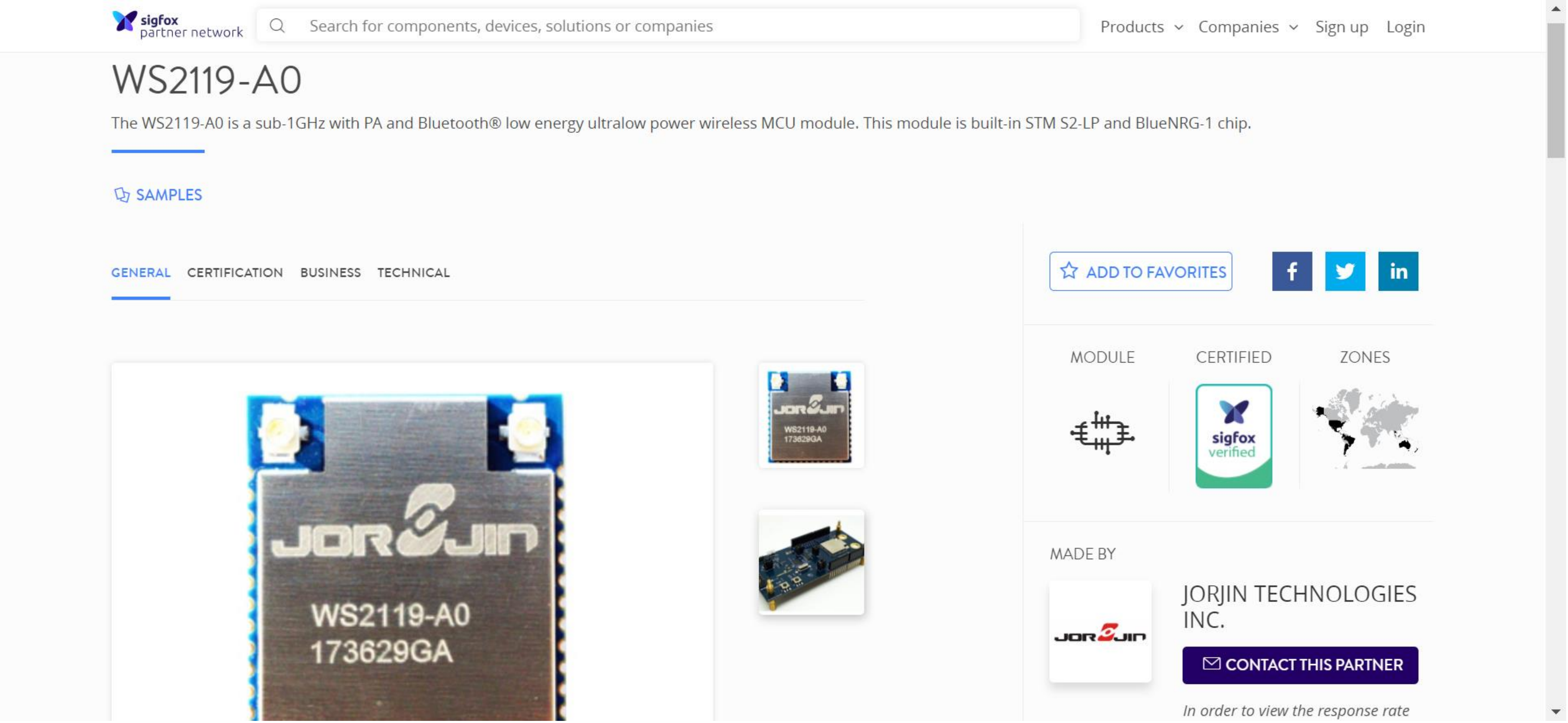
MADE BY

JORJIN TECHNOLOGIES INC.

CONTACT THIS PARTNER

In order to view the response rate

# P1 Cert. for Jorjin's WS2119(RCZ2 and RCZ4)



WS2119-A0

The WS2119-A0 is a sub-1GHz with PA and Bluetooth® low energy ultralow power wireless MCU module. This module is built-in STM S2-LP and BlueNRG-1 chip.

MADE BY

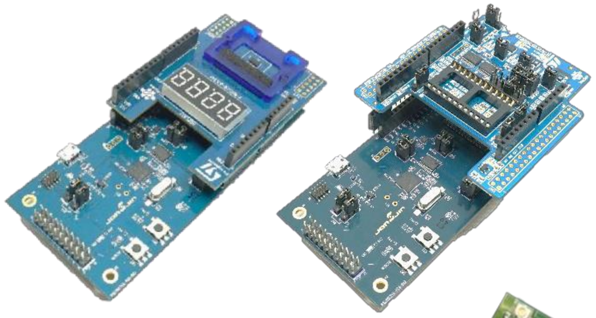
JORJIN TECHNOLOGIES INC.

*In order to view the response rate*

# Evaluation boards with different form factors and platform drivers

**WG78XXBEC8**
WiLink 8 Evaluation Board for
WG7801-B0/D0 (WL1801),
WG7831-B0/D0 (WL1831), and
WG7833-B0 (WL1833)

TI DM385 Driver Ready TI
AM437x Driver Ready
Nvidia T30/T40/K1 Driver Ready
Atmel SAMA5D3 Driver Ready NXP
i.MX6Q Driver Ready
NXP i.MX6 Driver Ready
NXP i.MX7 Driver Ready
Renesas RZG1/A1 Driver Ready
NXP i.MX8 Driver on Roadmap



**WS2118E00/WS2119E20**
WG211X-X0 Sigfox Module Evaluation Board LSM6DS0:
MEMS 3D accelerometer (±2/±4/±8 g)
+ 3D gyroscope (±245/±500/±2000 dps)
LSM6DS3: MEMS 3D accelerometer (±2/±4/±8/±16 g)
+ 3D gyroscope (±125/±245/±500 /±1000 /±2000 dps)
LPS25HB: MEMS pressure sensor
VL53L0X: Time-of-Flight (ToF) laser-ranging module
ST95HF: NFC/RFID tag and reader
LIS3MDL: 3-axis digital magnetometer

**WG6611P00**
WG6611-00 UART Pmod Module Evaluation Board
Renesas Synergy S1 & S3 Driver Ready

**WG6031P00**
WG6031-00 SPI Pmod Module Evaluation Board
Renesas Synergy S5 & S7 Driver Ready
NXP i.MX6 Driver on Roadmap NXP
i.MX7 Driver on Roadmap NXP
i.MX8 Driver on Roadmap

**ZB7412E0B**
ZB7412-00 BoosterPack Evaluation Kit
Standalone BT5 Module
Support MSP432™ MCU Series

**WG3222E00**
WG3222-00 SD Card
NXP i.MX6 Driver on Roadmap NXP
i.MX7 Driver on Roadmap NXP
i.MX8 Driver on Roadmap Renesas
RZ Driver on Roadmap

**WU3222H00**
WU3222-00 Half Mini PCIe Card x86
Platforms Driver on Roadmap

**WE3222E00**
WE3222-00 M.2 2230 Card
Qualcomm S820 Driver in Progress

| Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | | | | 2016 | | | | 2017 | | | | 2018 | | | |

# Quality Module Design Flow

**Project kick-off**

- ODM
- Own-brand

**EVT Stage** (20 – 40 pcs)

- RF verification
- Function verification
- Initiation on
  - Manual fixture production

**DVT Stage** (100 – 200 pcs)

- Design for manufacturability check
- BOM fixed
- Layout fixed
- Initiation on
  - production line test (PLT) program development

**PVT Stage** (≈ 1000 pcs)

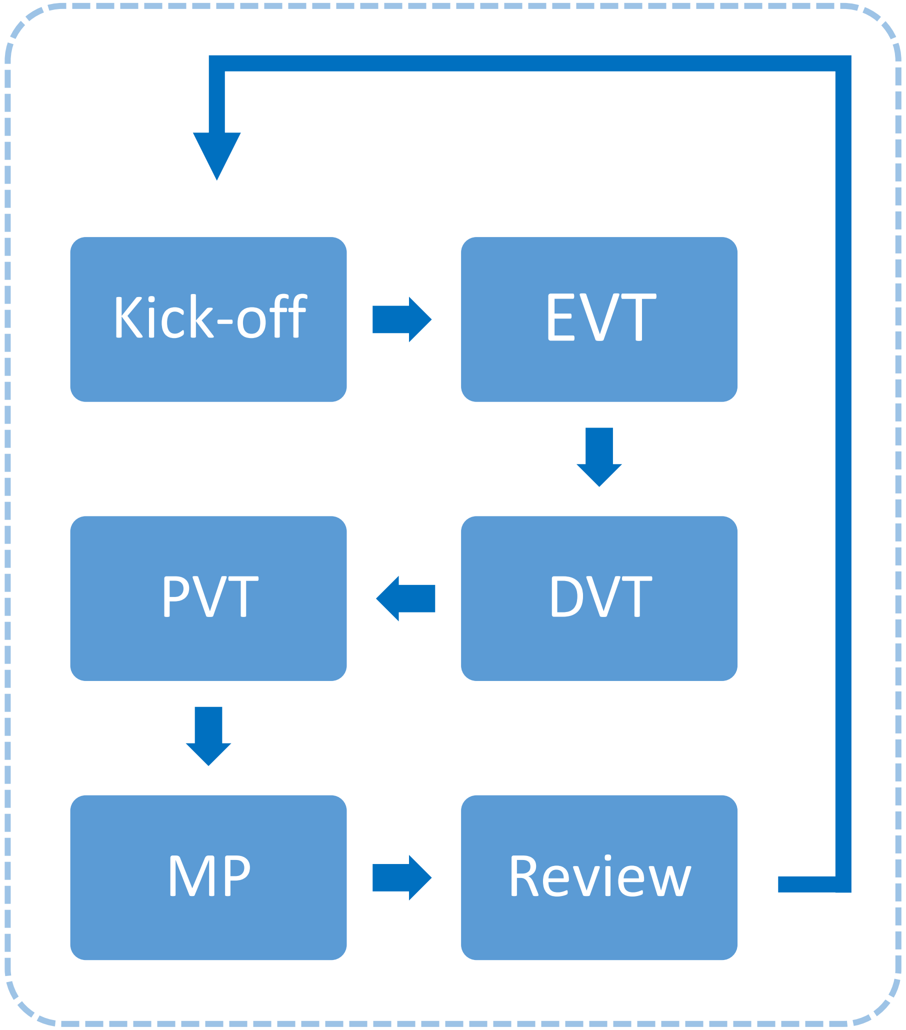
- PLT program verification
- Yield > 99%
- CZ test complete
- Reliability test complete

**MP Stage**

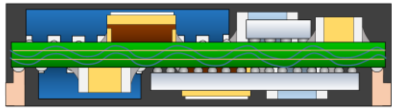
- MP announcement
- Data log monitoring/control

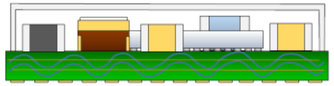
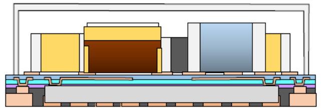
**Internal Review**

- Lean management
- Business process management
  - Make sure mistakes (if any) do not happen again



# SoSP & µSiP

| Items | SoSP-PoP | SoSP-SP | SoSP-PS | SoSP-DSP |
|---|---|---|---|---|
| Module Illustration |  |  |  |  |
| Process Complexity | Mid | High | Normal | Low |
| Package Outline | BGA on PLGA | PLGA | SQFN | QFN |
| Package Thickness Ratio | 2 | 1.8 | 1.6 | 1.5 |

| Items | Jorjin BLE Module | Jorjin BLE µSiP Module |
|---|---|---|
| Package Illustration |  |  |
| Manufacturing Process | PCB manufacturing » SMD placement » reflow » singulation | L/F attach » die attach » molding » RDL » SMD placement » reflow » singulation |
| Package Type | LGA | FO QFN |
| Package Dimension | 12 x 11 x 2.2 mm | 8.6 x 7.6 x 1.8 mm |
| Package Size/Weight/Cost Ratio | 1 / 1 / 1 | 0.5 / 0.7 / 1.3 |

***Innovation, Self-motivation, Efficiency. Utmost Customer Satisfaction.***

**Thank you!**

**Sales Dept.**
**sales@jorjin.com**