

# WL18x1 WiLink™ 8 Single-Band Combo Device Supporting Wi-Fi®, Bluetooth®, and Bluetooth® Low Energy

## 1 Features

- General
  - Packaged in wafer scale package (WSP) for small PCB footprint
  - Provides efficient direct connection to battery by employing several integrated switched mode power supplies (DC2DC)
  - Seamless integration with TI Sitara and other application processors
  - Operating temperature: -40°C to +85°C
  - 105°C Extended temperature range is supported only in defined use-case profile
- Wi-Fi®
  - Baseband processor and RF Transceiver with support for IEEE 802.11b/g/n
  - Integrated 2.4G-Hz PA for complete WLAN solution
  - Medium access controller
    - Hardware-based encryption and decryption using 64-, 128-, and 256-bit WEP, TKIP, or AES keys
    - Support Wi-Fi Protected Access (WPA, WPA2, WPA3) and IEEE 802.11i
  - IEEE Std 802.11d,e,h,i,k,r PICS Compliant
  - 802.11v support for high-precision timing and location approximation
  - Supports 4 bit SDIO host interface, including High Speed (H3) and V3 modes
- *Bluetooth®* and Bluetooth Low Energy (WL1831 only)
  - Bluetooth 5.1 secure connection compliant and CSA2 support (Declaration ID: D032799)
  - Host controller interface (HCI) transport for Bluetooth over UART
  - Dedicated audio processor support for SBC encoding and A2DP
  - Dual-mode Bluetooth and Bluetooth Low Energy
  - TI's Bluetooth and Bluetooth Low Energy certified stack
- Key Benefits
  - Differentiated use cases by configuring WiLink 8 simultaneously in two roles (STA and AP) to connect directly with other Wi-Fi devices on different RF channels (Wi-Fi networks)
  - Different provisioning methods for in-home devices - connect to Wi-Fi in one step
  - Low Wi-Fi power consumption in connected idle (<800 µA)

- Configurable wake-on-WLAN filters to only wake up the system
- Wi-Fi and Bluetooth single antenna coexistence

## 2 Applications

- [Grid Infrastructure](#)
  - [Electricity Meter](#)
  - [String Inverter](#)
  - [Micro Inverter](#)
  - [Energy Storage Power Conversion System \(PCS\)](#)
- [Building and Home Automation](#)
  - [HVAC Gateway](#)
  - [Thermostat](#)
  - [Building Security Gateway](#)
- [Factory Automation](#)
- [Motor Drives](#)
- [Appliances](#)
- [Retail Automation and Payment](#)



### 3 Description

The WiLink™ 8 WL18x1 is a highly integrated single-chip WLAN, Bluetooth, and Bluetooth Low Energy device that forms a complete stand-alone communication system.

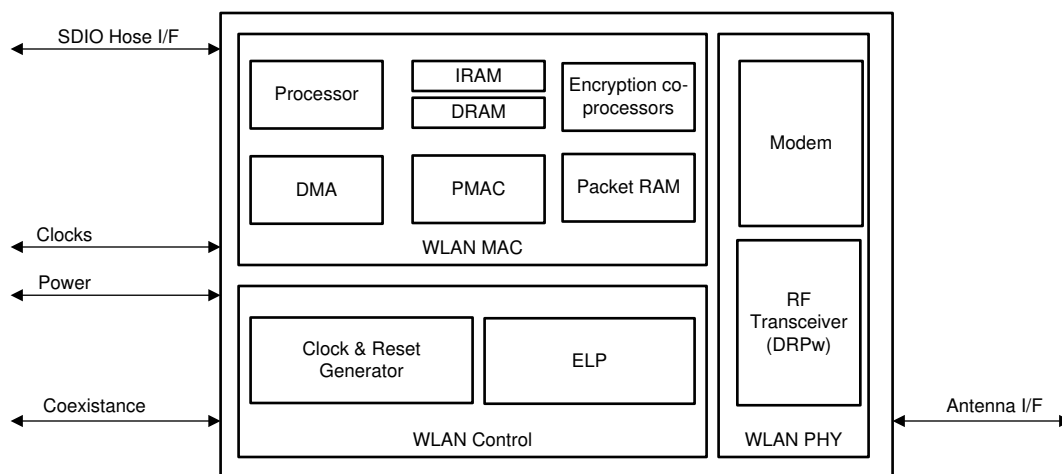
The device is the 8th-generation connectivity combo chip from Texas Instruments. As such, the WL18x1 is based upon proven technology and complements the TI integrated devices for connectivity portfolio. This device is ideal for use in mobile devices, mobile computer and catalog embedded device applications due to its low current, small area and coexistence-friendly features. TI offers drivers for high-level operating systems such as Linux® and Android™. Additional drivers, such as WinCE and RTOS, which includes QNX, Nucleus, ThreadX, and FreeRTOS are supported through third parties.

**Table 3-1. Device Information**

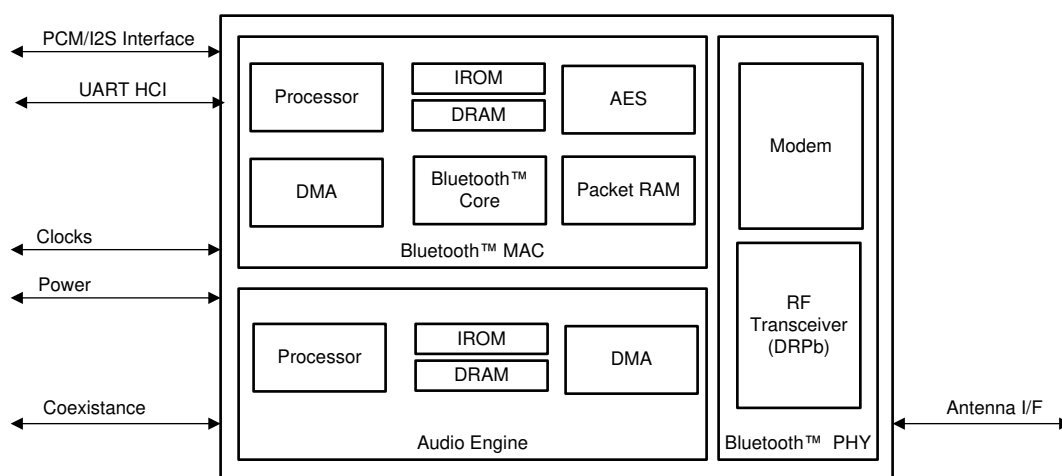
Device	WLAN 2.4-GHz SISO	Bluetooth, Bluetooth Low Energy
WL1801	✓	
WL1831	✓	✓

## 4 System Block Diagram

Figure 4-1 shows a system diagrams for the WL18x1.



**Figure 4-1. WL18x1 High-Level Wi-Fi System Diagram**



**Figure 4-2. WL1831 High-Level Bluetooth System Diagram**

## Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
May 2021	*	Initial Release

## 5 Chip Packaging and Ordering

### 5.1 Ordering Information

WSP/CSP (Wafer/Chip Scale Package) 12x11 matrixes with lead-free balls RoHS compliant.

T&R P/N	ROM/SR	Pitch (mm)	Parts Per Reel	Package
WL1801GYFVR	ROM	0.4	2500	WSP 130 pin
WL1831GYFVR	ROM	0.4	2500	WSP 130 pin

#### 5.1.1 Device Support Nomenclature

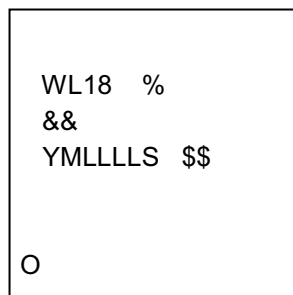
To designate the stages in the product development cycle, TI assigns prefixes to the part numbers. These prefixes represent evolutionary stages of product development from engineering prototypes through fully qualified production devices.

Device development indicator:

- X Experimental, preproduction, sample or prototype device. Device may not meet all product qualification conditions and may not fully comply with TI Specifications. Experimental/Prototype devices are shipped against the following disclaimer: "This product is still in development and is intended for internal evaluation purposes." Notwithstanding any provision to the contrary, TI makes no warranty expressed, implied, or statutory, including any implied warranty of merchantability of fitness for a specific purpose, of this device.
- Null Device is qualified and released to production. TI's standard warranty applies to production devices.

### 5.2 Chip Marking

Chip Topside



- WL18 = WL18xx family
- % = Features ( Blank = standard power)
- && = Device Mark 1 & 2
- YM = 2 digit Date Code
- LLLL = Lot Trace code
- S = Assembly Site Code per QSS 005-120
- \$\$ = Fab Code
- O = Pin one indicator (filled solid)

#### 5.2.1 Marking System

In order to minimize delivery time to customer for small quantities, TI may ship the device ordered or an equivalent device currently available that contains at least the functions of the part ordered. From all aspects, this device will behave exactly the same as the part ordered. For example:

Customer orders device WL1831.

Part shipped may be either WL1831, WL1833, WL1835, or WL1837

Mark 1 indication (first digit):

Mark	WLAN	Bluetooth	WL180x	WL183x
0&	Tested		Valid	
3&	Tested	Tested	Valid	Valid

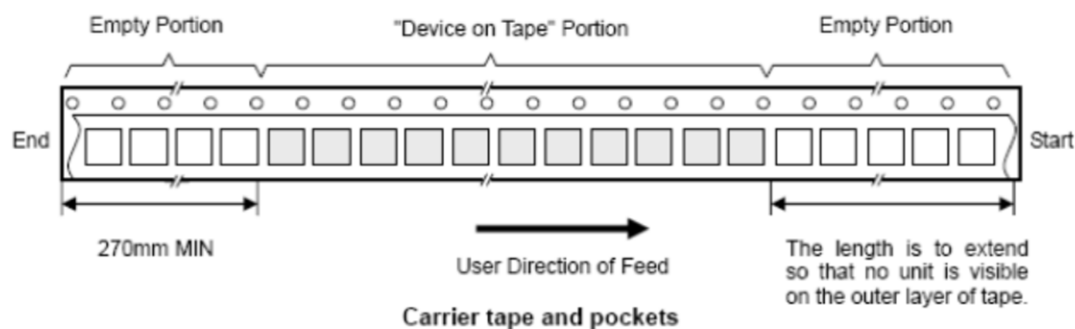
Mark 2 indication (second digit):

Mark	WLAN 2.4G	WLAN 5G	MIMO 2.4G	WL18x1	WL18x3	WL18x5	WL18x7
&1	Tested			Valid			

Mark	WLAN 2.4G	WLAN 5G	MIMO 2.4G	WL18x1	WL18x3	WL18x5	WL18x7
&3	Tested	Tested		Valid	Valid		
&5	Tested		Tested	Valid		Valid	
&7	Tested	Tested	Tested	Valid	Valid	Valid	Valid

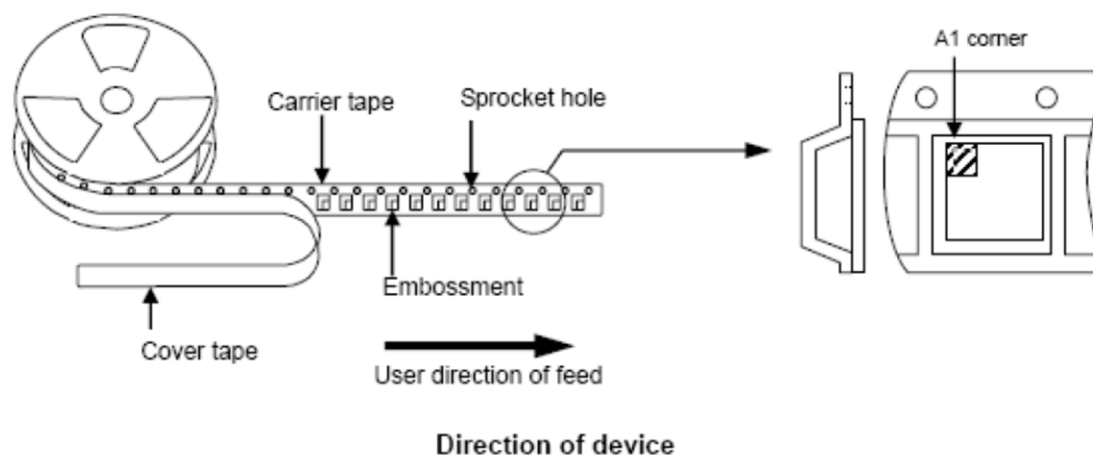
## 5.3 Tape and Reel Information

### 5.3.1 Tape Direction



### 5.3.2 Part Direction

Toward pulling out direction of tape, A1 corner is at the left side.

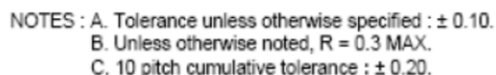


### 5.3.3 Part Orientation

The device is located such as symbolization in upper side and lead pins in lower side.



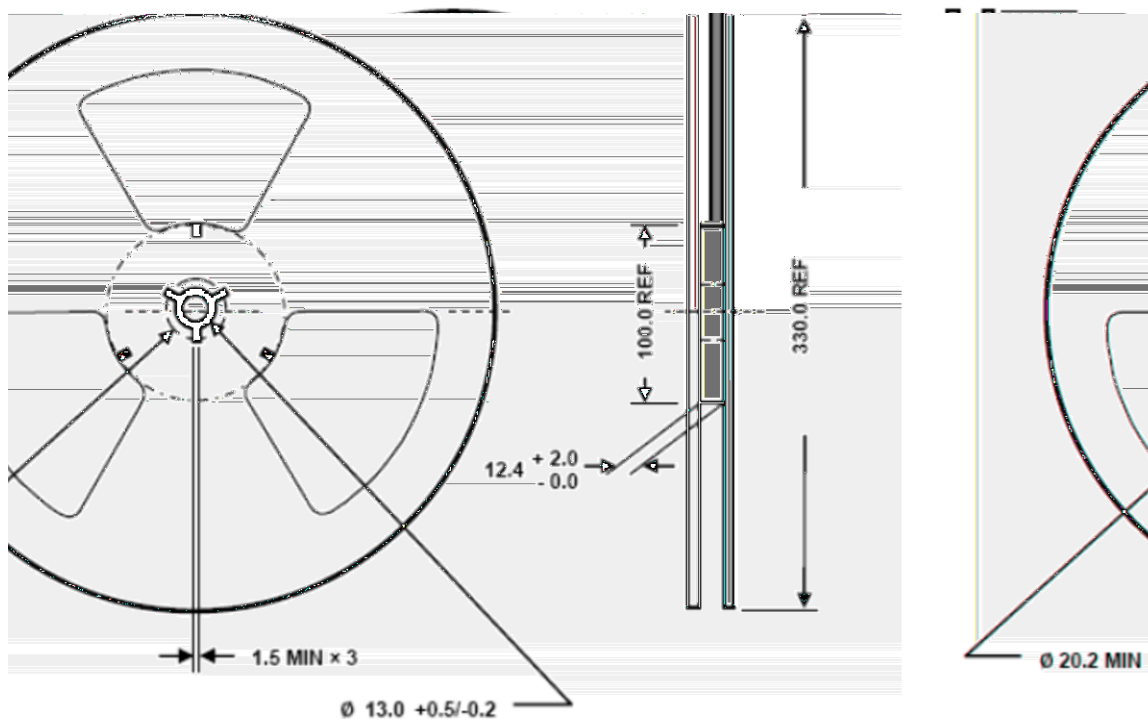
Tape Dimensions (12 mm width Tape) (Notes A, B)



Tape dimension (UNIT : mm)

1. Tape cover = 9.3mm. The cover tape does not cover the index hole and does not shift to outside from carrier tape
2. Tape structure
  - The carrier tape is made of plastic and the structure is shown in above schematic.
  - The device is put on embossed area of carrier tape, and covered by cover tape made of plastic.
3. ESD Countermeasure: Plastic material used in both carrier tape and cover tape are static dissipative

## Reel dimension (ø 330 mm Reel, 12 mm width Tape)



Reel dimension (UNIT : mm)

just for showing dimensions, so the design may be different.

This reel drawing is

1. Material: Polystyrene (Static Dissipative / Antistatic)

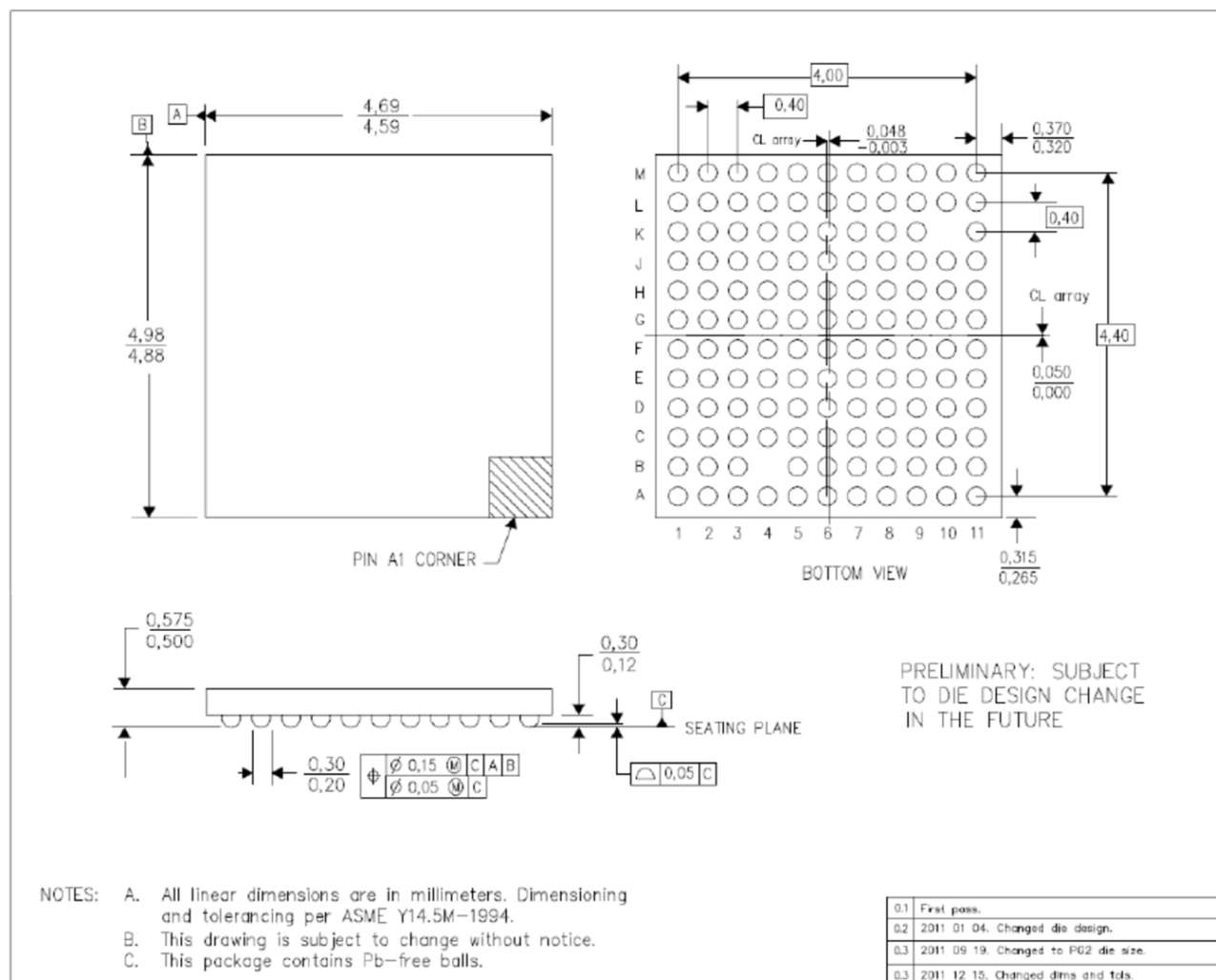
## 5.4 Packaging

- Tape leader fixed by drafting tape.
- Reel is placed in moisture-proof anti-static bag and bag is heat-sealed.
- Reel bag is placed into corrugated fiberboard box. Filler such as cushion is added if space exists inside.
- Reel box is stacked into corrugated fiberboard shipping box.

## 6 Mechanical Drawing

YFV (WL185x PG2 – N130)

DIE-SIZE BALL GRID ARRAY (WCSP)



DESCRIPTION	MIN	NOM	MAX
Body size (W, mm) *	4.59	4.64	4.69
Body size (L, mm) *	4.88	4.93	4.98
Overall thickness (t, mm)	0.500	0.538	0.575
Terminal pitch (mm)	-----	0.40	-----
Ball / terminal diameter (mm)	0.20	0.25	0.30
Ball height (mm)	0.12	0.21	0.30
Ball matrix footprint (W x L)	-----	11x12	-----
Coplanarity at terminal / ball side (mm)	-----	-----	0.05



## PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
<a href="#">WL1801GYFVR</a>	Active	Production	DSBGA (YFV)   130	2500   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 105	WL18G 01
WL1801GYFVR.B	Active	Production	DSBGA (YFV)   130	2500   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 105	WL18G 01
<a href="#">WL1831GYFVR</a>	Active	Production	DSBGA (YFV)   130	2500   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 105	WL18G 31
WL1831GYFVR.B	Active	Production	DSBGA (YFV)   130	2500   LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 105	WL18G 31

<sup>(1)</sup> **Status:** For more details on status, see our [product life cycle](#).

<sup>(2)</sup> **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

<sup>(3)</sup> **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

<sup>(4)</sup> **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

<sup>(5)</sup> **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

<sup>(6)</sup> **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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