TEXAS INSTRUMENTS
WL1801, WL1831
ZHCSO12 – MAY 2021

支持 Wi-Fi®、Bluetooth® 和低功耗 Bluetooth® 的 WL18x1 WiLink™ 8 单频带组合器件

1 特性

- 一般特性
  - 采用 Wafer Scale Package (WSP) 封装，PCB 空间占用小
  - 通过采用多个集成式开关模式电源 (DC2DC)，提供与电池的高效直接连接
  - 无缝集成 TI Sitara 和其他应用处理器
  - 工作温度：-40°C 至 +85°C
  - 仅定义的用例配置文件中支持 105°C 工作温度范围。
- Wi-Fi 连接®
  - 支持 IEEE 802.11b/g/n 的基带处理器和射频收发器
  - 实现完整 WLAN 解决方案的集成式 2.4GHz PA
  - 介质访问控制器
    - 使用 64、128 和 256 位 WEP、TKIP 或 AES 密钥且基于硬件的加密和解密
    - 支持 Wi-Fi 保护接入（WPA、WPA2、WPA3）和 IEEE 802.11i
  - IEEE 标准 802.11d/e/h/i/k/r PICS 兼容
  - 802.11v 支持，提供高精度计时和位置近似估计
  - 支持 4 引脚 SDIO 主机接口，包括高速 (H3) 和 V3 模式
- *蓝牙*® 和低功耗蓝牙（仅限 WL1831）
  - 兼容蓝牙 5.1 安全连接并支持 CSA2（声明 ID：D032799）
  - 主机控制器接口 (HCI) 传输，用于通过 UART 进行蓝牙传输
  - SBC 编码和 A2DP 的专用音频处理器支持
  - 双面蓝牙和低功耗蓝牙
  - TI 的蓝牙和低功耗蓝牙认证堆栈
- 主要优势
  - 支持多种差异化用例，可通过在两极（STA 和 AP）上同时配置 WiLink 8，直接连接至不同 RF 通道（Wi-Fi 网络）上其他的 Wi-Fi 设备
  - 提供多种配置方法，一步即可将家用设备连接至 Wi-Fi
  - 连接空闲时 Wi-Fi 功耗低 (< 800µA)
  - 可配置的局域网唤醒滤波器可只将系统唤醒
  - Wi-Fi 和蓝牙单天线共存

2 应用

- 电网基础设施
  - 电表
  - 串式逆变器
  - 微型逆变器
  - 能量存储电源转换系统 (PCS)
- 楼宇和家居自动化
  - HVAC 网关
  - 恒温器
  - 楼宇安全网关
- 工厂自动化
- 电机驱动器
- 电器
- 零售自动化和支付

3 说明

WiLink™ 8 WL18x1 是一款高度集成的单芯片 WLAN、蓝牙和低功耗蓝牙器件，可构成一个完整的独立通信系统。

该器件是德州仪器 (TI) 的第 8 代连接组合芯片。因此，WL18x1 基于经过验证的技术，并完善了 TI 的集成式连接器件产品系列。该器件具有低电流、面积小和友好共存等特性，因此非常适合移动设备、移动计算机和目录嵌入式设备应用。TI 提供适用于 Linux® 和 Android™ 等高级操作系统的驱动程序。WinCE 以及包括 QNX、Nucleus、ThreadX 和 FreeRTOS 在内的 RTOS 等其他驱动程序可通过第三方获得支持。

表 3-1. 器件信息

器件	WLAN 2.4GHz SISO	蓝牙、低功耗蓝牙
WL1801	✓	
WL1831	✓	✓

4 系统方框图

图 4-1 所示为 WL18x1 的系统图。

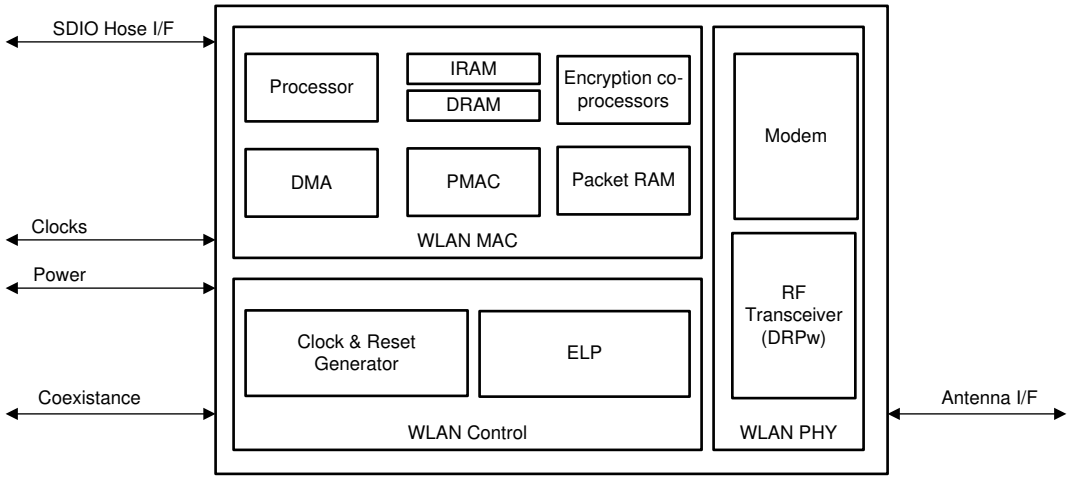


图 4-1. WL18x1 简化 Wi-Fi 系统图

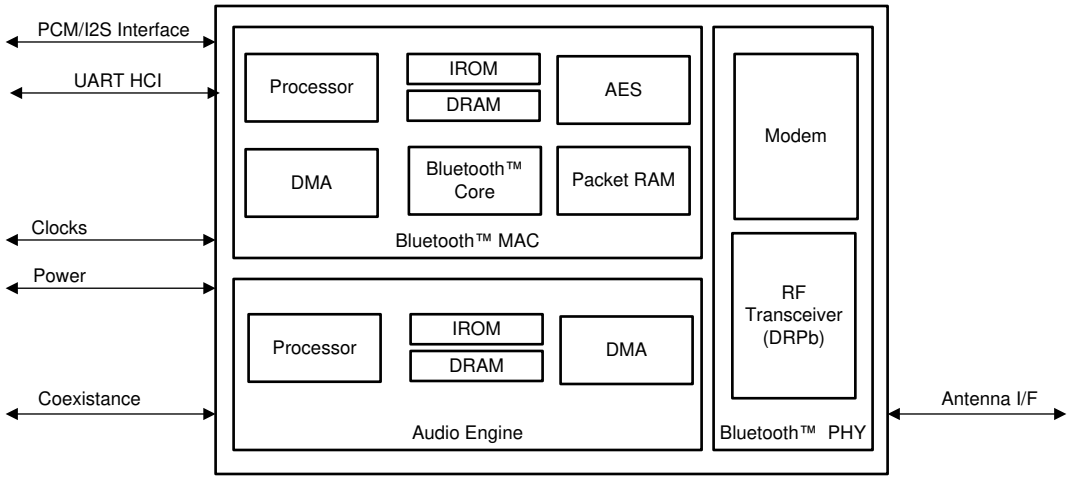


图 4-2. WL1831 简化蓝牙系统图

Revision History

注：以前版本的页码可能与当前版本的页码不同

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

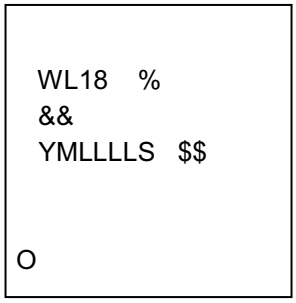
To designate the stages in the product development cycle, TI assigns prefixes to the part numbers. These prefixes represent evolutionary stages of product development from engineering prototypes through fully qualified production devices.

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

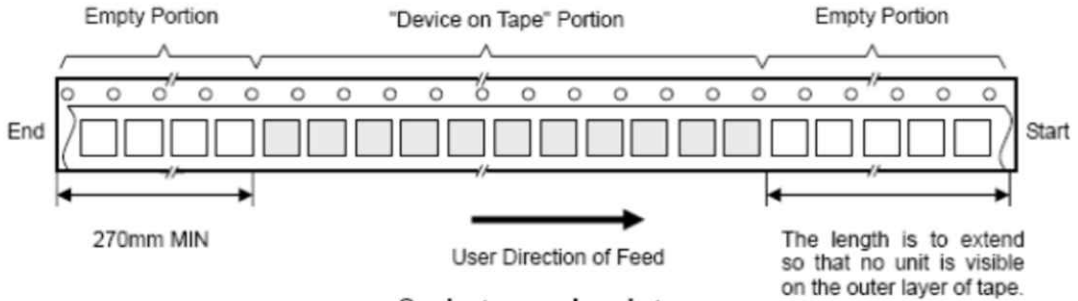
Mark 2 indication (second digit):

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

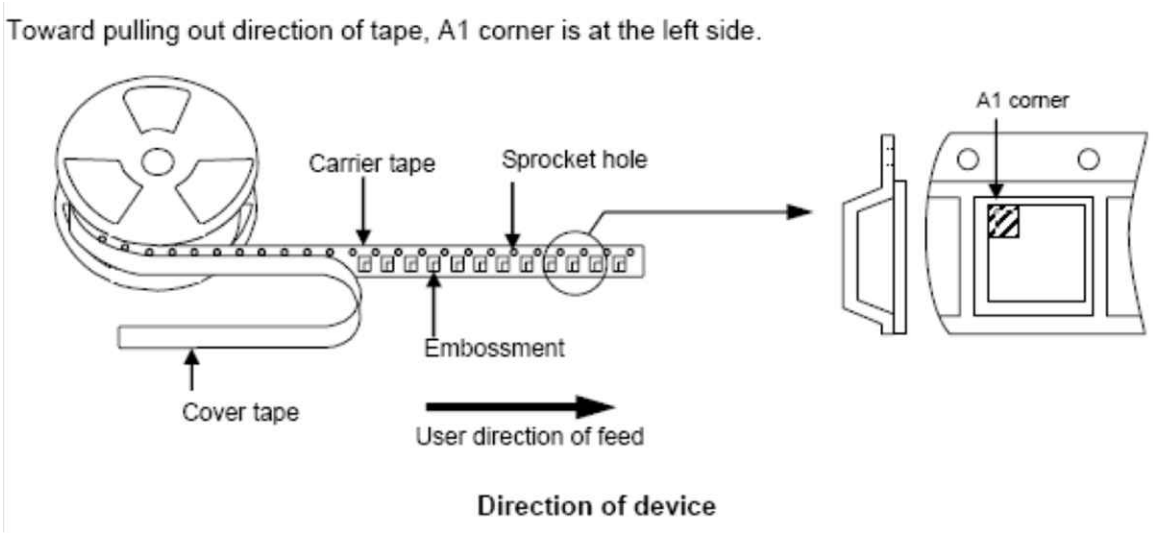
5.3 Tape and Reel Information

5.3.1 Tape Direction



Carrier tape and pockets

5.3.2 Part Direction



Direction of device

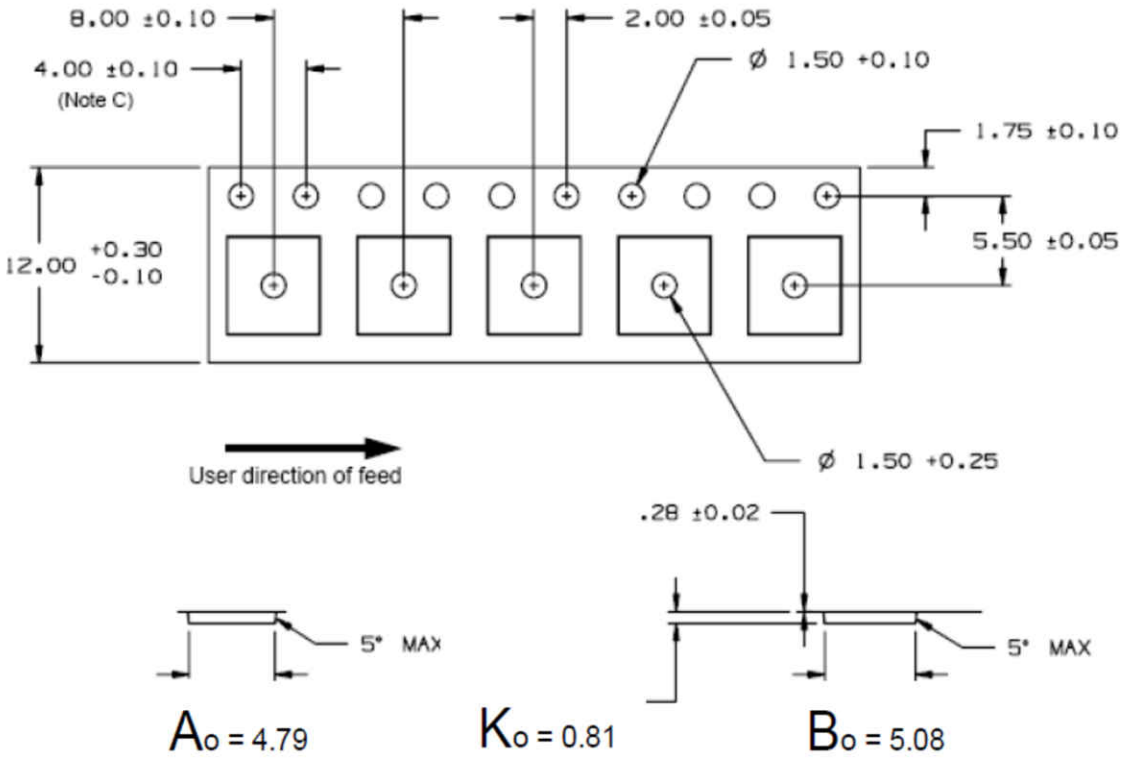
5.3.3 Part Orientation

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

Insertion of device

5.3.4 Tape Dimensions

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



NOTES : A. Tolerance unless otherwise specified : ± 0.10.
B. Unless otherwise noted, R = 0.3 MAX.
C. 10 pitch cumulative tolerance : ± 0.20.

Tape dimension (UNIT : mm)

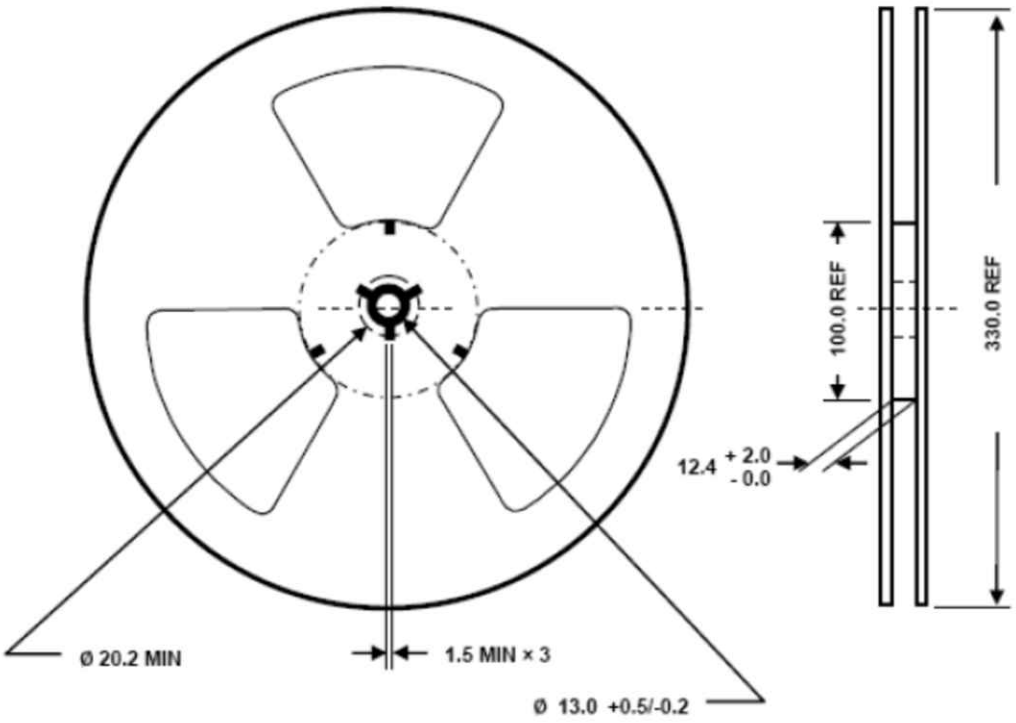
1. Tape cover = 9.3mm. The cover tape does not cover the index hole and does not shift to outside from carrier tape
2. Tape structure

   - 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

5.3.5 Reel Dimensions

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



Reel dimension (UNIT : mm)

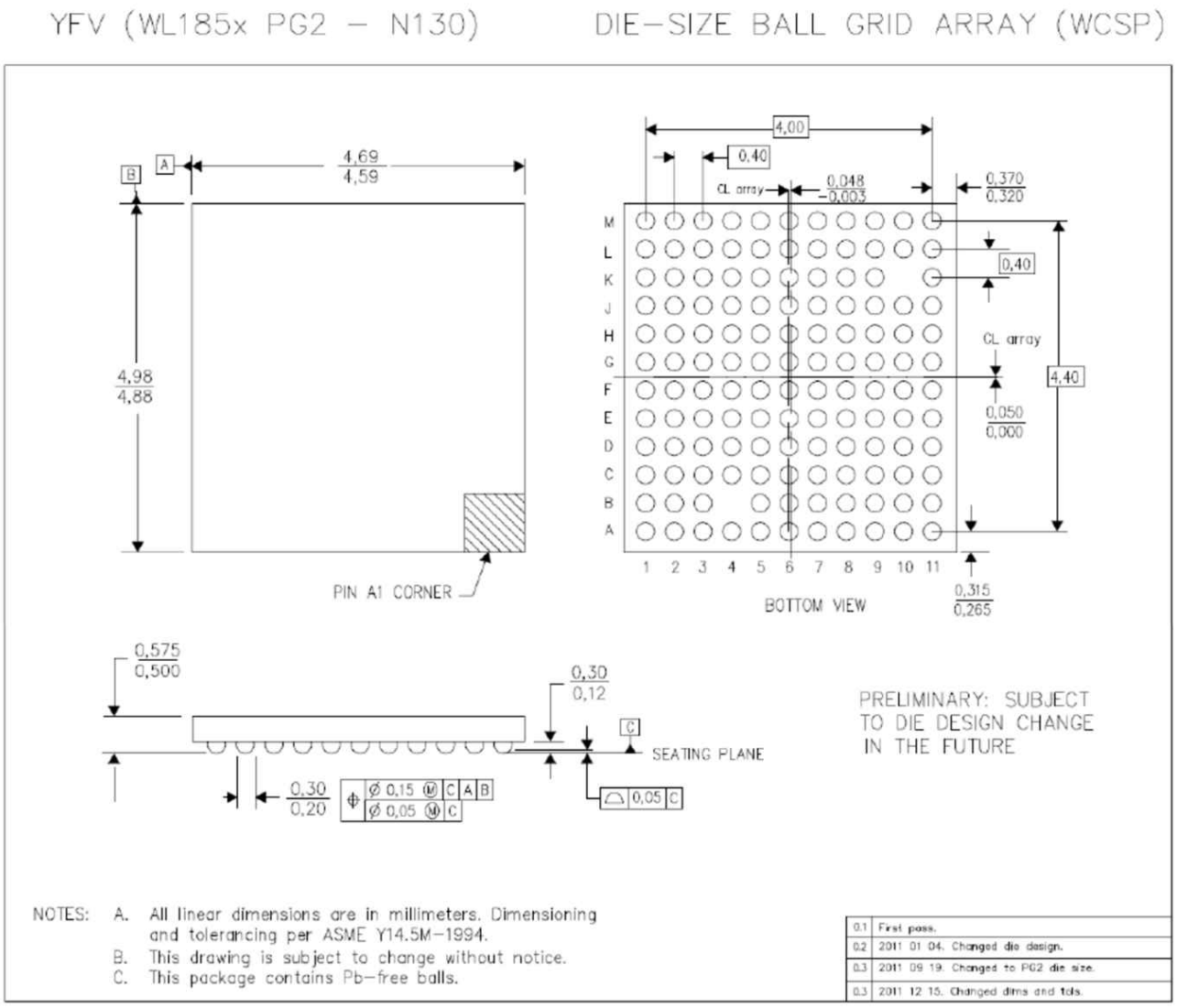
This reel drawing is just for showing dimensions, so the design may be different.

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



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

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
WL1801GYFVR	ACTIVE	DSBGA	YFV	130	2500	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 105	WL18G 01	Samples
WL1831GYFVR	ACTIVE	DSBGA	YFV	130	2500	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 105	WL18G 31	Samples

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices 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.

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