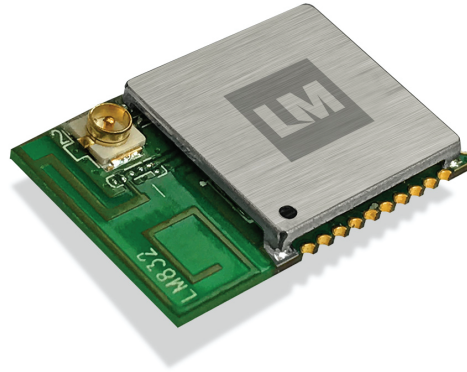
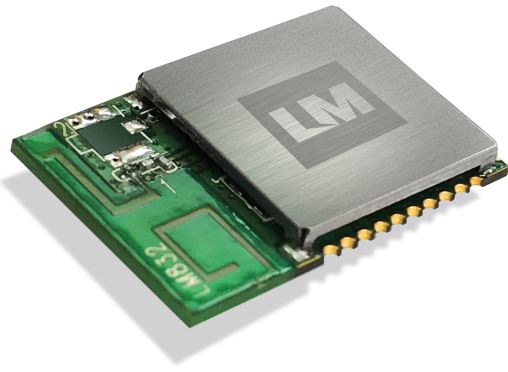




LM832 WiFi and Bluetooth® Dual Mode Combi Module

Standalone with SDIO and UART Interfaces

Product	LM832
Part No	See Last Page
Revised	13/MAR/2018
Version	1.1



Features

- WiFi 802.11 b/g/n
- Bluetooth® v4.1 specification (Dual Mode)
- SDIO for WiFi and UART (High Speed) for Bluetooth
- IPEX Connector or PCB Antenna options
- Full speed Bluetooth® Piconet and Scatternet supported
- Enterprise level security - WPA/WPA2 certification for WiFi
- 1T 1R, Supporting 150Mbps Bandwidth
- Support sophisticated WiFi/BT coexistence mechanism to enhance collection performance
- Support Bluetooth adaptive power management mechanism
- 19mm x 12mm x 2mm
- SMT Side and Bottom Pads for easy production
- See our website for this products certifications.
- RoHS, REACH and WEEE

Overview

The LM832 module incorporates an intelligent coexistences mechanism for WiFi 802.11 b/g/n via SDIO and Dual Mode Bluetooth® v4.1 via UART. This is ideal for significantly minimising the BoM cost and PCB space.

This versatile module combines WiFi and Bluetooth® radios, plus an ARM Cortex M3 microcontroller with an 8 MB flash memory for running the application. It also incorporates 4 GPIO pins for interfacing with peripheral devices.

The LM832 utilises a powerful Cypress chipset, which enables the LM832 HCI Module to be compatible with the latest Android platform, Linux Kernel v4.3.6 and Android4.4_V2.19.

It's SMT side and bottom pads allow for easy manufacture and placement within your product.

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General Specification

Wireless

Wireless Standard	<p>WiFi:</p> <p>802.11 b/g/n</p> <p>Bluetooth:</p> <p>v2.1+EDR / v3.0 / v4.1</p>
Module Type	Standalone (Embedded Wireless Stack) or Host Controller Interface (HCI)
Profiles	TBA
OS Compatibility	Linux, Android and Windows XP
Security	<p>WiFi:</p> <p>WEP, WPA Personal, WPA2 Personal, WMM, WMM-PS(U-APSD), WMM-SA, WAPI, AES (Hardware Accelerator), TKIP(host-computed), CKIP(Software Support)</p> <p>Bluetooth:</p> <p>Secure Simple Paring</p>
Network Architecture	<p>WiFi:</p> <p>Ad hoc mode (Peer-to-Peer), Infrastructure mode, Software AP and WiFi Direct</p> <p>Bluetooth:</p> <p>Piconet; Scatternet</p>

Hardware

Chipset	Cypress
Antenna	PCB Antenna or IPEX Receptical
Microcontroller (MCU)	ARM Cortex-M3, with 512 kB on-chip flash
Flash Memory	8 MB
RAM	128 kB
Interfaces	<p>WiFi:</p> <p>SDIO 2.0</p> <p>Bluetooth:</p> <p>UART (Baud rates up to 4 Mbps)</p>
Power Supply	3V6 (VDDIO) or 4V8 (VBAT)
Crystal Oscillators	26 MHz and 32.768 kHz (External)
Development Kit	LM522

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General Specification (Continued)

RF Characteristics

Tx Output Power

WiFi:

17dBm – 802.11b@11Mbps 15dBm – 802.11g@6Mbps 15dBm –
802.11g@54Mbps 13dBm – 802.11n@MCS0_HT20 13dBm –
802.11n@MCS7_HT20

Bluetooth:

Class 1

Rx Sensitivity

WiFi:

-76dBm – 802.11b@11Mbps -65dBm – 802.11g@54Mbps
-64dBm – 802.11n@MCS7_HT20

Bluetooth:

-89dBm@1Mbps -90dBm@2Mbps -83dBm@3Mbps

Data Transfer Rate

WiFi:

802.11b: 1, 2, 5.5, 11Mbps; 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps;
802.11n MCS0 to 7 for HT20MHz

Bluetooth:

Basic Rate 1Mbps; Enhanced Rate 2, 3Mbps;
High Speed 6, 9, 12, 18, 24, 36, 48, 54Mbps

Frequency

2.4GHz to 2.4835 GHz

Modulation Scheme

WiFi:

802.11b: CCK, DQPSK, DBPSK 802.11g: 64QAM, 16QAM, QPSK,
BPSK 802.11 g/n: 64QAM, 16QAM, QPSK, BPSK

Bluetooth:

GFSK, $\pi/4$ DPSK, 8DPSK

Spread Spectrum

WiFi:

IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum)
IEEE 802.11g/n: OFDM (Orthogonal Frequency Division Multiplexing)

Bluetooth:

FHSS (Frequency Hopping Spread Spectrum)

Operating Channel

WiFi (2.4GHz):

11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe
14: (Ch. 1-14) – Japan

Bluetooth (2.4GHz):

Ch. 0 to 78



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General Specification (Continued)

Physical Characteristics

Operating Temperature	-20°C to +60°C ambient temperature 5 to 90 % (non-condensing)
Storage Temperature	-20°C to +70°C ambient temperature 0 to 95 % (non-condensing)
Dimensions (L x W x H)	19mm x 12mm x 2mm
Weight	0.44 g (PCB Antenna Module) and 0.46 g (IPEX Module)
Certifications	See our website for this products certifications
Compliance	RoHS, REACH and WEEE

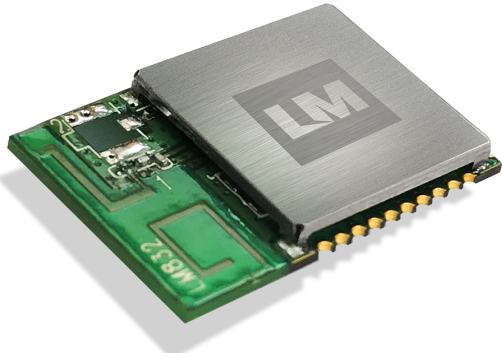
LM832 WiFi and Bluetooth® Dual Mode Combi Module

Standalone with SDIO and UART Interfaces

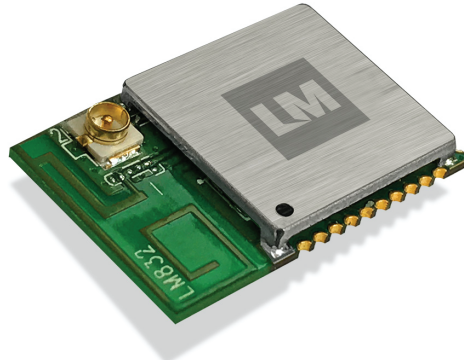
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Antenna Options

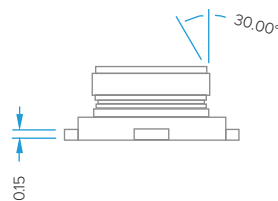
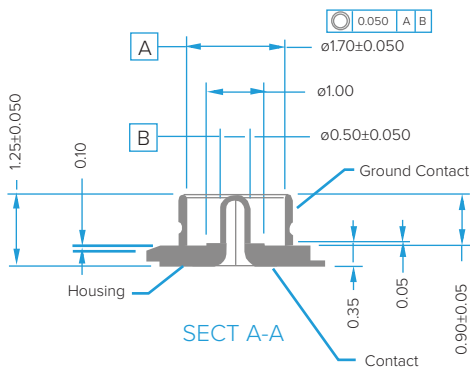
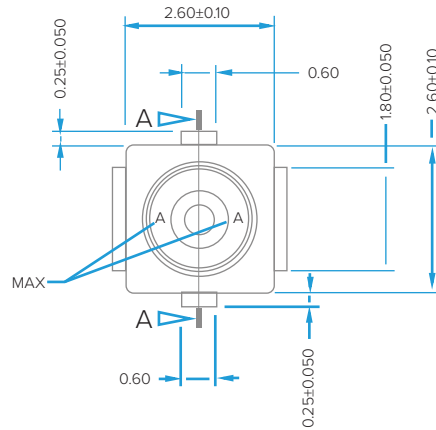
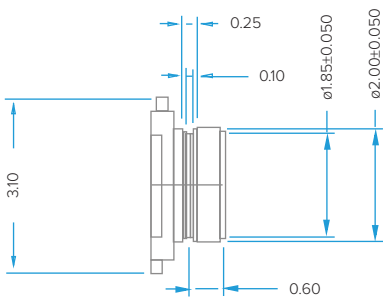


RF Type 1: PCB Antenna Module



RF Type 2: IPEX Connector Module

RF Connector Dimensions



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LM832

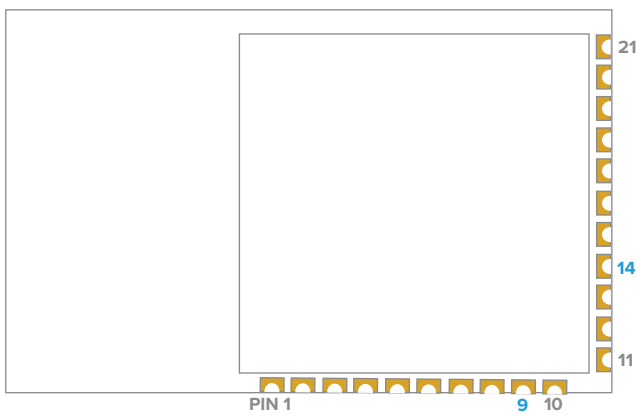
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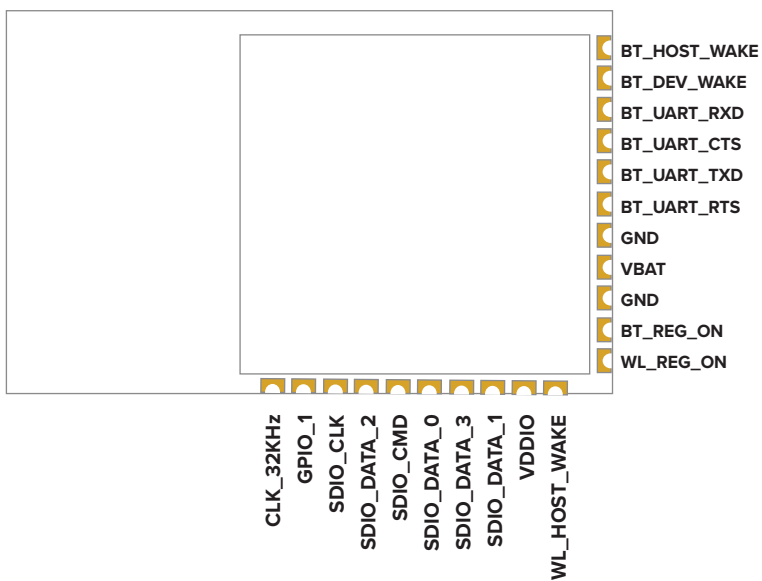
Powering

- The LM832 can be powered in one of 2 ways:

- 1) Powered through the VDDIO (Pin 9)
- 2) Powered from a Lithium ion / Lithium polymer battery through VBAT (Pin 14)



Pin Outs



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Standalone with SDIO and UART Interfaces

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Pin Assignments

Pin	Signal	Type	Description
1	CLK_32KHz	Input	External sleep clock input (32.768 kHz). If an external 32.768 kHz clock cannot be provided, pull this pin low. However, BLE will be always on and cannot enter deep sleep.
2	GPIO_1	I/O	Programmable GPIO pins
3	SDIO_CLK	Input	SDIO clock input
4	SDIO_DATA_2	I/O	SDIO data line 2. Also used as a strapping option.
5	SDIO_CMD	I/O	SDIO command line
6	SDIO_DATA_0	I/O	SDIO data line 0
7	SDIO_DATA_3	I/O	SDIO data line 3
8	SDIO_DATA_1	I/O	SDIO data line 1
9	VDDIO	Input	VDDIO input supply. Connect to VDDIO.
10	WL_HOST_WAKE	I/O	Programmable GPIO pins. This pin becomes an output pin when it is used as WLAN_HOST_WAKE/out-of-band signal.
11	WL_REG_ON	Input	Used by PMU to power up or power down the internal regulators used by the WiFi section. Also, when deasserted, this pin holds the WiFi section in reset. This pin has an internal 200 kΩ pull-down resistor that is enable by default. It can be disabled through programming.
12	BT_REG_ON	Input	Used by PMU to power up or power down the internal regulators used by the Bluetooth section. Also, when deasserted, this pin holds the Bluetooth section in reset. This pin has an internal 200 kΩ pull-down resistor that is enable by default. It can be disabled through programming.
13	GND	Power	Ground
14	VBAT	Power	VBAT input power supply
15	GND	Power	Ground
16	BT_UART_RTS	Output	UART request-to-send. Active-low request-to-send signal for the HCI UART interface.
17	BT_UART_TXD	Output	UART serial output. Serial data output for the HCI UART interface.
18	BT_UART_CTS	Input	UART clear-to-send. Active-low clear-to-send signal for the HCI UART interface.
19	BT_UART_RXD	Input	UART serial input. Serial data input for the HCI UART interface.
20	BT_DEV_WAKE	I/O	DEV_WAKE or general-purpose I/O signal
21	BT_HOST_WAKE	I/O	HOST_WAKE or general-purpose I/O signal

LM832 WiFi and Bluetooth® Dual Mode Combi Module

Standalone with SDIO and UART Interfaces

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Recommended Operating Conditions

DC Power Supply	Signal	Minimum	Maximum
Voltage for VBAT	VBAT	3V	4.8V
Voltage for digital I/O	VDDIO	1.71 V	3.63V

SDIO Interface I/O Pins

VDDIO_SD = 1V8	Signal	Minimum	Maximum
Input high voltage	VIH	1.27V	
Input low voltage	VIL		0.58V
Output high voltage (at 2mA)	VOH	1.40V	
Output low voltage (at 2mA)	VOL		0.45V

VDDIO_SD = 3V3	Signal	Minimum	Maximum
Input high voltage	VIH	0.625V x VDDIO	
Input low voltage	VIL		0.25V x VDDIO
Output high voltage (at 2mA)	VOH	0.75V x VDDIO	
Output low voltage (at 2mA)	VOL		0.125V x VDDIO

Other Digital I/O Pins

VDDIO = 1V8	Signal	Minimum	Maximum
Input high voltage	VIH	0.65V x VDDIO	
Input low voltage	VIL		0.35V x VDDIO
Output high voltage (at 2mA)	VOH	VDDIO - 0.45V	
Output low voltage (at 2mA)	VOL		0.45V

VDDIO = 3V3	Signal	Minimum	Maximum
Input high voltage	VIH	2V	
Input low voltage	VIL		0.8V
Output high voltage (at 2mA)	VOH	VDDIO - 0.4V	
Output low voltage (at 2mA)	VOL		0.4V



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Standalone with SDIO and UART Interfaces

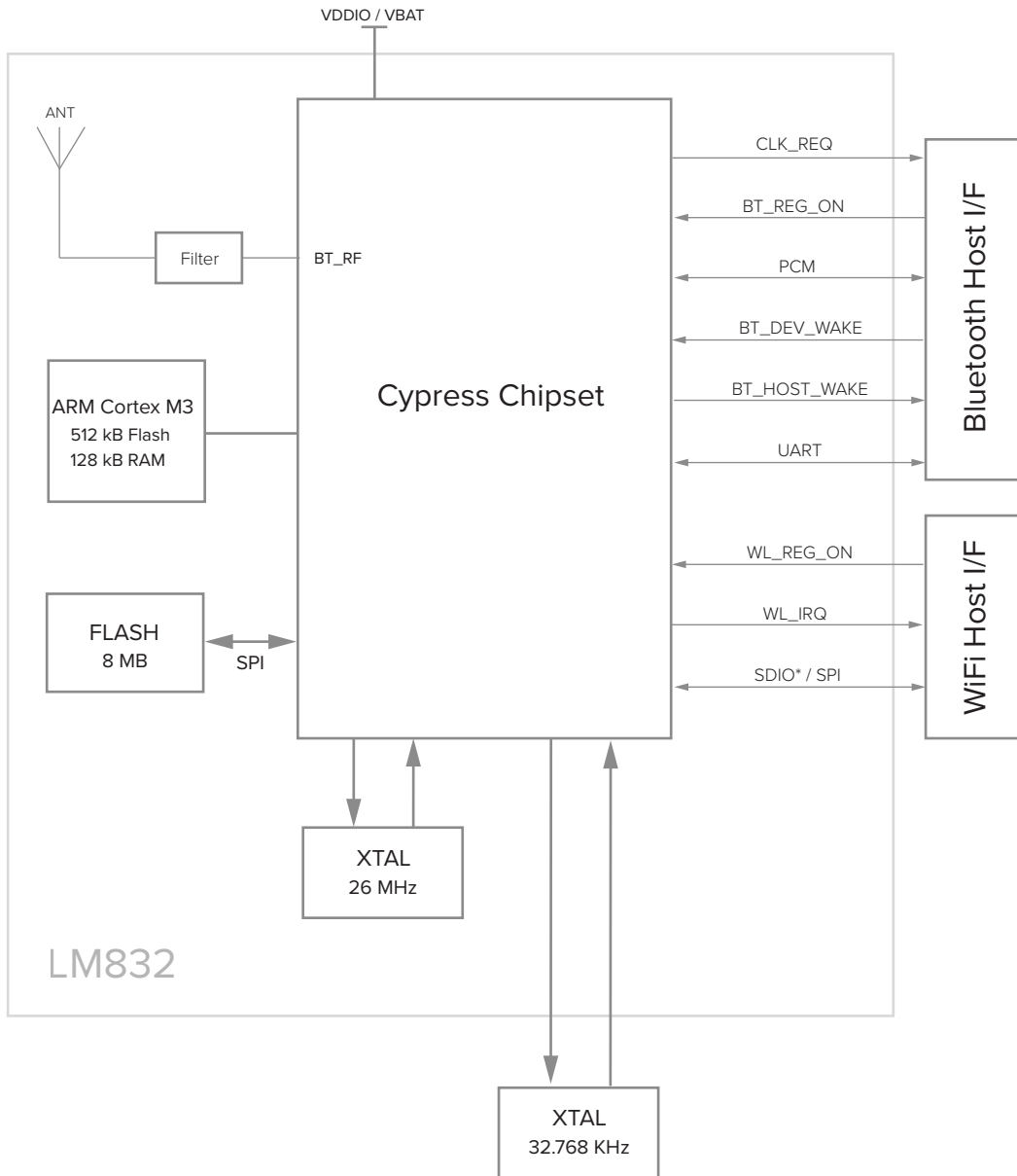
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Module Block Diagram



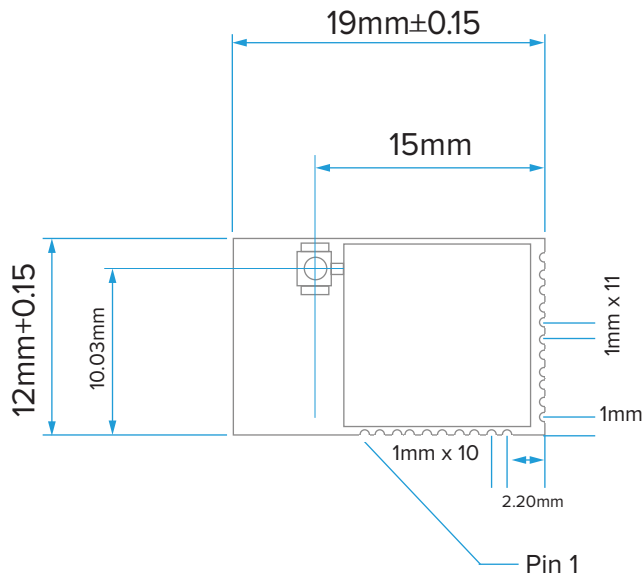
LM832 WiFi and Bluetooth® Dual Mode Combi Module

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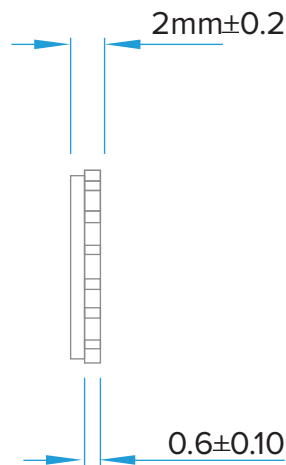
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Physical Dimensions

TOP VIEW



Shielding

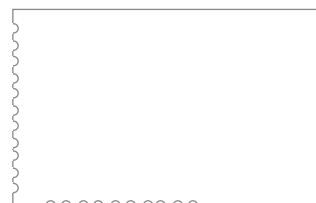


SIDE VIEW

FRONT VIEW



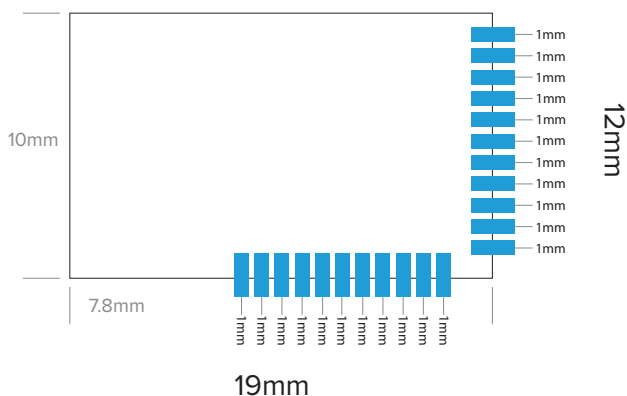
BOTTOM VIEW



PCB Footprint

The recommended layout pads for LM832 module are shown below.

TOP VIEW





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Standalone with SDIO and UART Interfaces

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PCB Drying Conditions

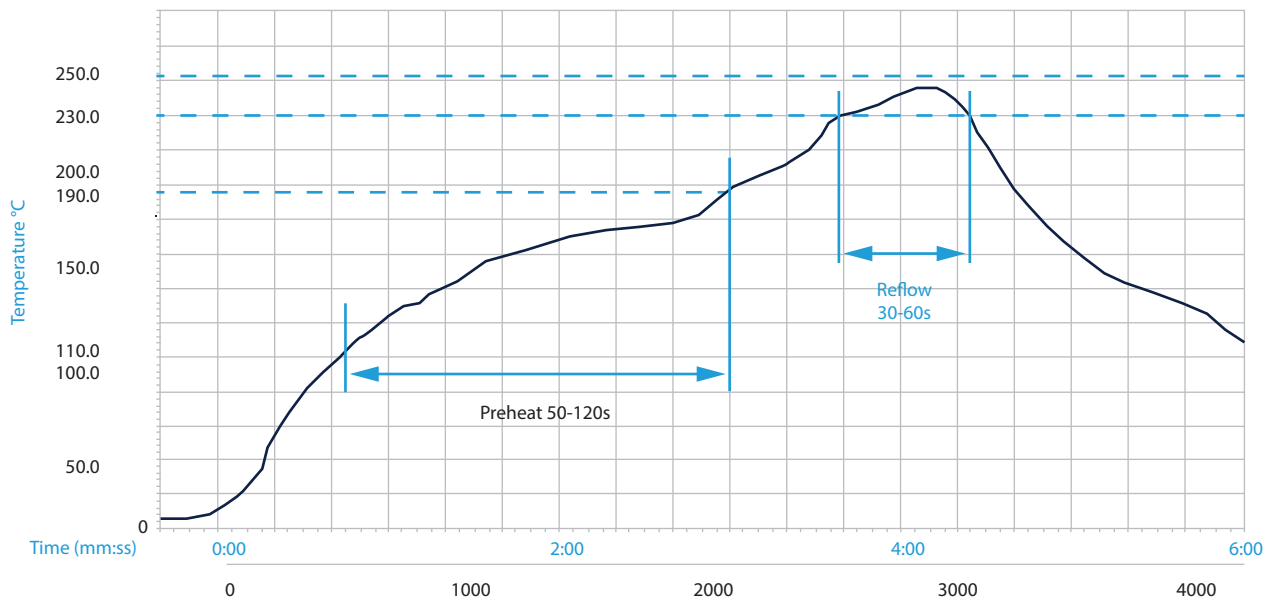
This module is a Moisture Sensitivity Level 3 (MSL-3) surface mount device.

Please refer below for drying conditions prior to the solder reflow processes.

If your PCB was baked at the below temperatures, you should follow the below guidelines.

Bake @ 125 °C		Bake @ 90 °C		Bake @ 40 °C	
Exceeding floor Life By > 72h	Exceeding floor Life By ≤ 72h	Exceeding floor Life By > 72h	Exceeding floor Life By ≤ 72h	Exceeding floor Life By > 72h	Exceeding floor Life By ≤ 72h
9 hours	7 hours	33 hours	23 hours	13 days	9 days

Soldering and Reflow Chart



1. If the system PCBA is double side design please reflow the side without this module first.
2. Don't let the solder machine temperature over 250 or follow solder paste vender's recommended temperature.
3. The Ramp-up temperature speed is 1~4 oC per second, the Ramp-down temperature speed is 1~4 oC per second.
4. This temperature reflow chart is for reference only, it depends on the manufacturing machine's characters requirement.

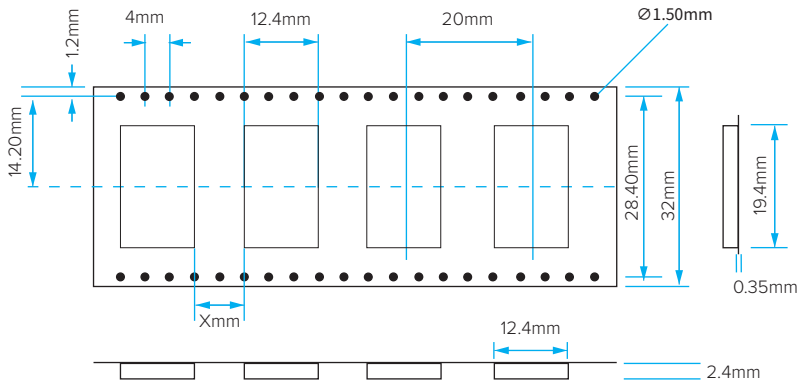
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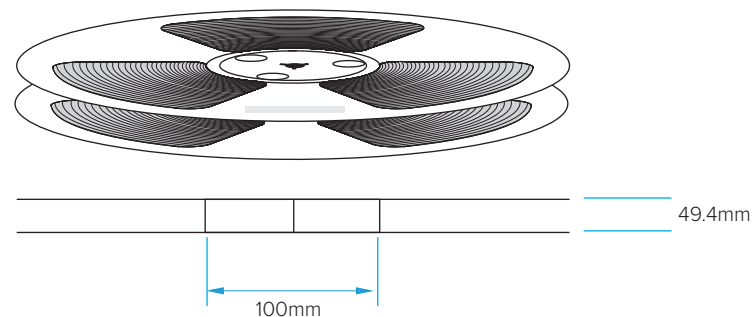
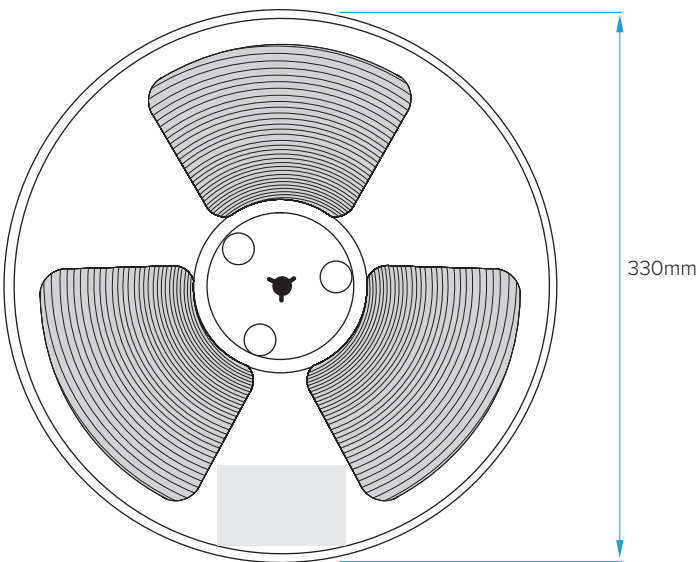
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Tape and Reel Packaging

Tape Dimensions



Reel Dimensions



Notes

- Carton Dimensions (L x W x H):
395mm x 360mm x 305mm

Quantities

- 1500 modules per Tape
- 5 Boxes per Carton
- 7500 modules per carton

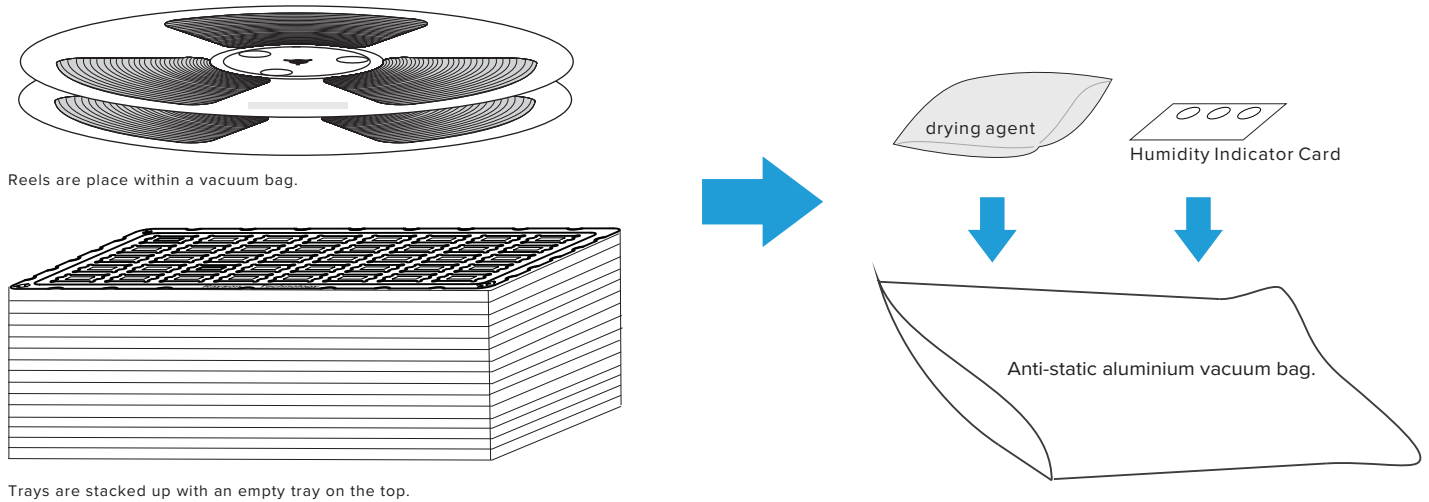
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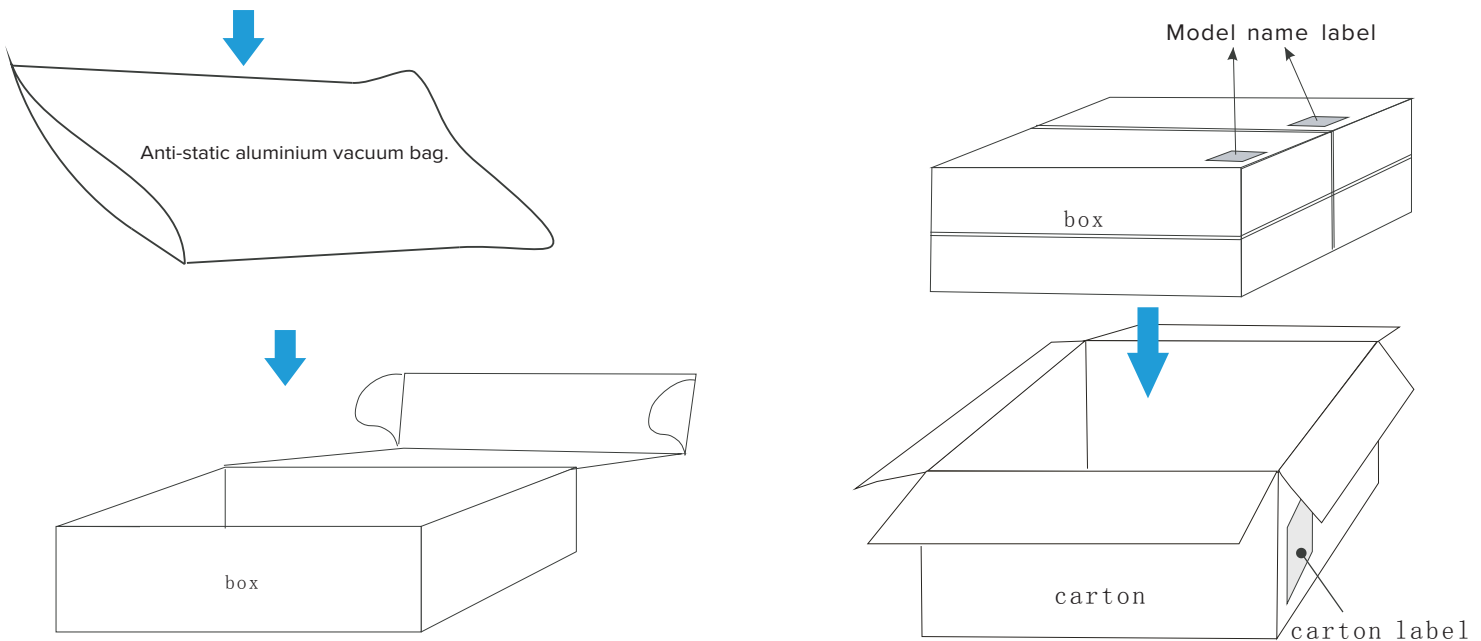
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Packaging for Tape & Reel / Tray

The trays/reels are stacked and inserted into an anti-static vacuum bag, with the anti-static, model name and moisture sensitive labels affixed.



The vacuum bag is placed inside the box and a model name label affixed on the front-side of each box.



Each carton contains 4 boxes.



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Datasheet Version Notes

v1.0	13 MAR 2018	Added version notes to datasheet.
v1.1	13 MAR 2018	MSL Description text improvement in the PCB Drying Conditions section.

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See Below

LM832 Packaging Options



832-0476

3.3V Module with IPEX Connector

MOD SDIO Wi-Fi + BT4.1 ROM 3-4.8v IPEX -20c PCS



832-0472

3.3V Module with IPEX Connector

MOD SDIO Wi-Fi + BT4.1 ROM 3-4.8v IPEX -20c TRAY



832-0473

3.3V Module with IPEX Connector

MOD SDIO Wi-Fi + BT4.1 ROM 3-4.8v IPEX -20c T&R



832-0477

3.3V Module with PCB Antenna

MOD SDIO Wi-Fi + BT4.1 ROM 3-4.8v PCB ANT -20c PCS



832-0474

3.3V Module with PCB Antenna

MOD SDIO Wi-Fi + BT4.1 ROM 3-4.8v PCB ANT -20c TRAY



832-0475

3.3V Module with PCB Antenna

MOD SDIO Wi-Fi + BT4.1 ROM 3-4.8v PCB ANT -20c T&R

- Product User Guides, Manuals and Configuration Software can be downloaded via our website - <http://www.lm-technologies.com/downloads>