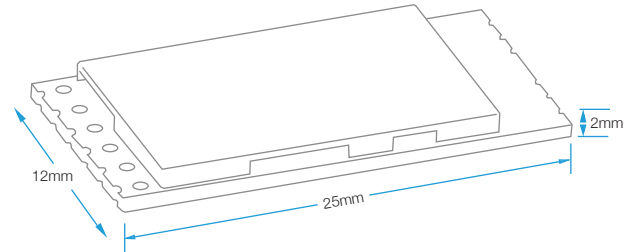




# LM811 WiFi and Bluetooth HCI Combination Module

Bluetooth Classic + EDR & LE 4.0 Standards in Class 1  
WiFi 802.11n UFL Antenna Receptacle

Product LM811  
Part No 811-0461  
Revised 12/JUN/2015



## Features

- IEEE standards support: 802.11 b/g/n/d/e/h/i
- Bluetooth 2.1 + EDR Class 1 - up to 3Mbps
- Supports Qualified Bluetooth 3.0
- Supports Qualified Bluetooth 4.0 Dual Mode Classic & Le
- Full speed Bluetooth Piconet and Scatternet supported
- Enterprise level security - WPA/WPA2 certification for WiFi
- A single USB Interface
- 1T 1R, Supporting 150Mbps Bandwidth
- Support sophisticated WiFi/BT coexistence mechanism to enhance collection performance
- Support Bluetooth adaptive power management mechanism
- RoHS & WEEE Compliant + Low Halogen Compliance
- Android 4.4 Compatible
- Linux Kernel v4.3.6 Compatible
- Linux Driver Support Link below.



## Overview

The LM811 module is a combination of WiFi 802.11n and Bluetooth 4.0 standards wireless communication via a single USB interface.

LM811 module fully supports functional compliance of IEEE 802.11b/g/n, Bluetooth Classic + EDR v2.1, v3.0, v4.0 and Low Energy over 4.0 standards.

The LM811 uses RealTek's 8723 BU platform, which enables the LM811 HCI Module to be compatible with the latest Android platform, Linux Kernel v4.3.6 and Android4.4\_V2.19.

The LM811 HCI Module also offers low power consumption and an intelligent coexistence mechanism makes it ideal for multiple applications, such as tablets equipped with the latest Intel Bay Trail platform, Smart Phones, 2-in-1 detachable/convertible Notebooks, and HDMI Dongles (TV stick's).

## Certification

LM offers all of our modules with both FCC part 15b and CE RTT&E Certifications, as well as having SIG QDID listing and being USB Certified for Wireless. Additional country certifications will be added as sales demand.

LM has certified products in over 30 countries with multiple bodies in which we are affiliated, in which we adhere to their governance.

The range of LM811 HCI Combination Modules being produced by LM are expected to gain further certifications during the next 2-3yrs as this IC platform is due to offer EOL in 7yrs.

## Linux Driver Installation Support

See <http://www.lm-technologies.com/lm811-driver>



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## Packaging Options

Module Only  
Part No 811-0461

- User Guides, Manuals and Wicomm Configuration Software available to download via our website - <http://www.lm-technologies.com/support/downloads>

## General Specification

Product Name	LM811 WiFi and Bluetooth Module
Standards	IEEE 802.11 b/g/n/d/e/h/i, Bluetooth v2.1+EDR/v3.0/v3.0HS/v4.0
Data Transfer Rate	<p>WLAN</p> <p>802.11b: 1, 2, 5.5, 11Mbps</p> <p>802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps</p> <p>802.11n MCS0 to 7 for HT20MHz, MCS0 to 7 for HT40MHz</p> <p>BLUETOOTH</p> <p>Basic Rate 1Mbps</p> <p>Enhanced Rate 2, 3Mbps</p> <p>High Speed 6, 9, 12, 18, 24, 36, 48, 54Mbps</p>
Modulation Method	<p>WLAN:</p> <p>802.11b: CCK, DQPSK, DBPSK 802.11g: 64QAM, 16QAM, QPSK, BPSK 802.11n: 64QAM, 16QAM, QPSK, BPSK</p> <p>Bluetooth: 8DPSK, <math>\pi/4</math> DQPSK, GFSKFSK</p>
Operating Channel	<p>WLAN 2.4GHz:</p> <p>11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe</p> <p>14: (Ch. 1-14) – Japan</p> <p>BT 2.4GHz: Ch. 0 to 78</p>
Frequency Range	2.4GHz ISM band (2.400GHz to 2.4835 GHz)
Spread Spectrum	<p>WLAN IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum)</p> <p>WLAN IEEE 802.11g/n: OFDM (Orthogonal Frequency Division Multiplexing)</p> <p>Bluetooth: FHSS (Frequency Hopping Spread Spectrum)</p>
RF Output Power	<p>WLAN:</p> <p>17dBm – 802.11b@11Mbps 15dBm – 802.11g@6Mbps 14dBm – 802.11g@54Mbps 13dBm – 802.11n@MCS0_HT20 13dBm – 802.11n@MCS7_HT20 13dBm – 802.11n@MCS0_HT40 13dBm – 802.11n@MCS7_HT40</p> <p>Bluetooth: Max + 10dBm</p>



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## General Specification (Continued)

Network Architecture	WLAN: Ad hoc mode (Peer-to-Peer) Infrastructure mode Software AP WiFi Direct BT: Pico Net Scatter Net
Receiver Sensitivity	WLAN: -82dBm – 802.11b@11Mbps -71dBm – 802.11g@54Mbps -67dBm – 802.11n@MCS7_HT20 -64dBm - 802.11n@MCS7_HT40 Bluetooth: -89dBm@1Mbps -90dBm@2Mbps -83dBm@3Mbps
Operation Range	WLAN: Up to 180 meters in open space Bluetooth: Great than 10 meters in open space
OS Support	Windows XP/ Linux/ Android
Security	WLAN: WPA, WPA-PSK, WPA2, WPA2 -PSK, WEP 64bit & 128bit, IEEE 802.11x, IEEE 802.11i BT: Simple Paring
Bus Interface	USB 2.0
Power Consumption	See Power Consumption below.
Operating Temperature	0 – 60° C ambient temperature 0 to 90 % (non-condensing)
Storage Temperature	-20 ~ 70°C ambient temperature 0 to 95 % (non-condensing)
Dimensions	25 x 12 x 2 mm (L x W x H)

## Power Consumption

DC power for 5V	Performance	
Description	Typ	Units
Off	10	uA
Unassociated idle	40	mA
Associated idle for 2.4GHz band	70	mA
Data transfer for 2.4GHz	103	mA

Note: Data transfer test using the Linux driver: Linux\_v4.3.6\_11841.20140714

DC power for 3.3V	Performance	
Description	Typ	Units
Off	16	uA
Unassociated idle	90	mA
Associated idle for 2.4GHz band	141	mA
Data transfer for 2.4GHz	168	mA

Note: Data transfer test using the Linux driver: Linux\_v4.3.6\_11841.20140714

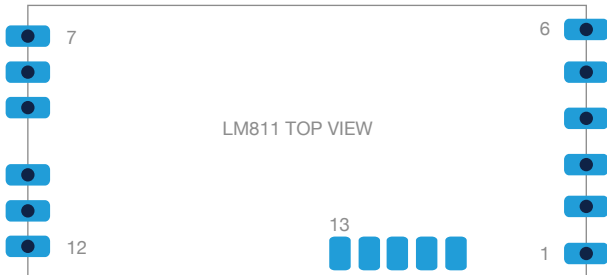


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## Pin Outs



## DC Power Input

Module	Min	Typical	Max	Unit
DC 5V	4.75	5	5.25	V
DC 3.3V module	3.135	3.3	3.465	V

**Note:** The LM811 module supports 5V and 3.3V input power, but can't coexist and choose one only.

## Pin Outs for LM811 Module

Pin	Signal	Input / Output	Description
1	WO-WLAN	Output	Chip Wake Host function
2	GND	Power	Ground
3	USB D+	I/O	USB D+ signal
4	USB D-	I/O	USB D- signal
5	VCC	Power	DC 3.3V
6	SUSPEND	Input	Host Wake Chip function.
7	GND	Power	Ground
8	ANT	-	WLAN/BT RF port (if don't using IPEX connector)
9	GND	Power	Ground
10	GND	Power	Ground
11	ANT	-	No Connection
12	GND	Power	Ground
13	BT_PCM_IN	Input	PCM data Input. This pin is also shared with GPIO0 and 3DG_SEL_A
14	BT_PCM_OUT	Output	PCM data Output. This pin is also shared with GPIO1 and 3DG_SYNC_A.
15	BT_PCM_SYNK	I/O	PCM frame Synchronization. This pin is also shared with GPIO2.
16	BT_PCM_CLK	I/O	PCM Clock. This pin is also shared with GPIO3.
17	EXT_XIN		NC_ Keep to floating



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## Factory Options

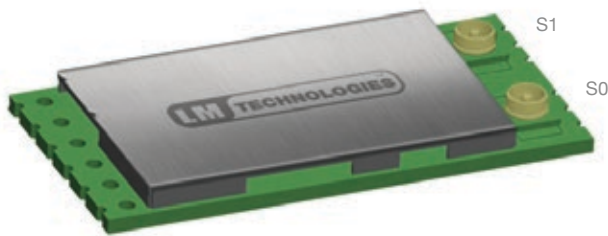


• RF Type 1



• RF type 2

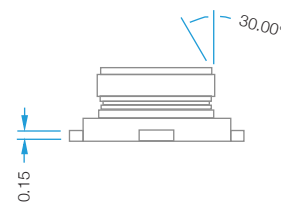
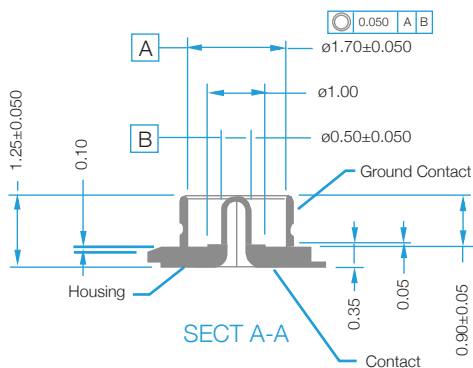
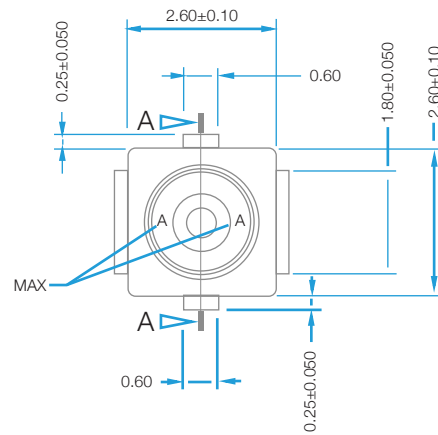
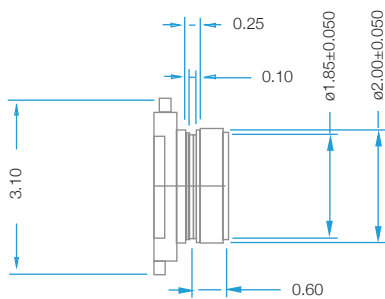
## Placement Notice



RF-OUT can select below RF connector (Type 1)

RF output on half-hole pin (Type 2)

## RF Connector Dimensions



The 811-0461 module WiFi/BT both single path S0 connection to ANT, and IPEX connector S1 path set to NC.

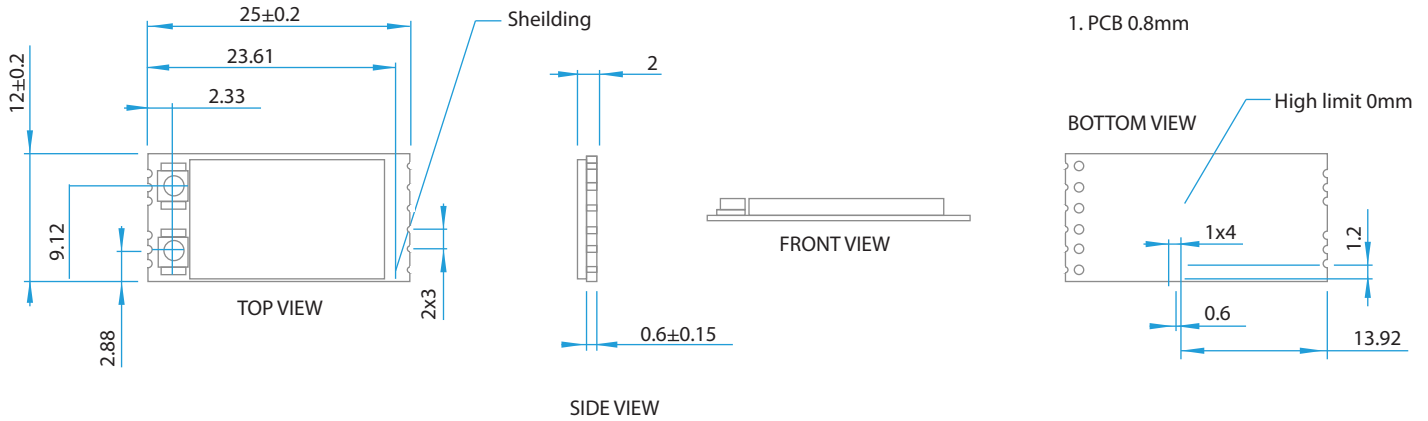


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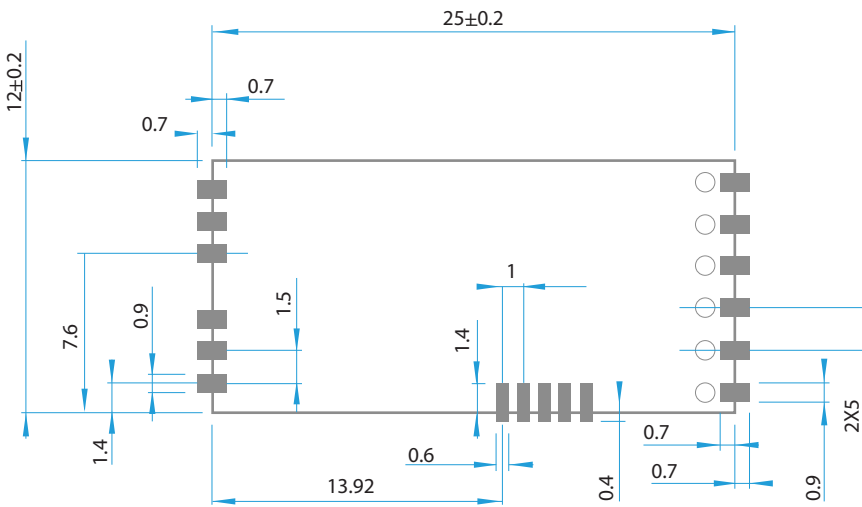
## Dimensions



## PCB Layout Footprint

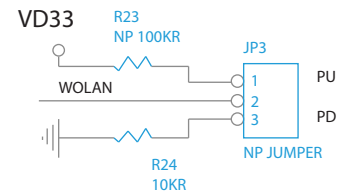
The recommended layout pads for 811-0461 module are shown below.

(Module top view)

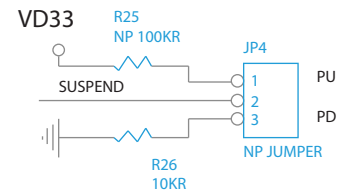


## Wake Function

Place WO-WLAN (Chip Wake Host) function.



Place SUSPEND (Host Wake Chip) function.



## Reference Temperature Reflow Table

This module is MSL-3 surface mount device; please refer below conditions for drying before solder reflow processes. (extracted from IPC/JEDEC J-STD-033B.1)

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

Full Manufacturing Re-Flow Instructions can be issued by request.