

# GAINSTRONG

# Oolite-Box-V1.0

*Specification Version 1.0.2*

Author : James

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Revision	Date	Contents of Revision Change	Remark
1.0.0	2018-01-25	First release	James
1.0.1	2018-02-01	Update RF Test Report	James
1.0.2	2018-07-27	Fixed some description error	James

## PRODUCT OVERVIEW

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### General Description

Oolite-Box-V1.0 is an industrial 4G/LTE wireless router that supports 802.11b/g/b 2x2 2.4GHz WIFI + 2\*4G/LTE Module. It compatible 802.11 a/b/g/n/ac maximum wireless rate can reach to 300Mbps. It is made up of base board and module. The base board use the QCA9531(QCA4531) chip that is a highly integrated and feature-rich IEEE802.11 b/g/n 2x2 2.4 GHz System-on-a-Chip (SoC) for advanced WLAN platforms. Oolite-Box-V1.0 support Openwrt/LEDE/QSDK, we will open source code and instruction for developers.

Oolite-Box-V1.0 has **only one WAN port and four LAN ports. 4G modules can be used to share the Internet.** It allows users not only able to share their internet by wired connection but also wireless connection. Oolite-Box-V1.0 standard version can update to support :

- 2 \* 4G/LTE Mini-Pcie Card
- 1 \* 4G/LTE Module ( Mini-Pcie Interface ) + 1 \* WiFi Module (Mini-Pcie Interface).

### Features:

- CPU: QCA9531(QCA4531) with 560 MHz MIPS 24Kc
- WiFi: 802.11 b/g/n 2\*2 2.4GHz 300Mbps (Can Add 1 \* WiFi Module )
- RAM: 64MByte DDR2 RAM (64/128MByte Optional)
- Flash: 16MByte SPI NOR Flash (8MB/16MB/32MB Optional)
- Power supply: 12V 2A DC
- Net Port: 1WAN+ 4 LAN
- Antenna: 2 \* External antenna (If add 4G/Mini-Pcie WiFi Card will be more.)
- 1 \* RESET Button
- 1 \* UART console (In the housing)
- 2 \* 4G Mini-Pcie Card (Optional)
- 1 \* 4G Module ( Mini-Pcie Interface ) + 1 \* WiFi Module (Mini-Pcie Interface) (Optional)
- Support Openwrt/LEDE/QSDK
- Operating Conditions: 0°C ~ 70°C (QCA9531) / -40°C ~ 85°C (QCA4531-BL3B)
- Size: 170.0mm x 87.5mm x 28.5mm

## PRODUCT PICTURES(STANDARD VERSION)

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## PRODUCT PICTURES(UPDATE VERSION)

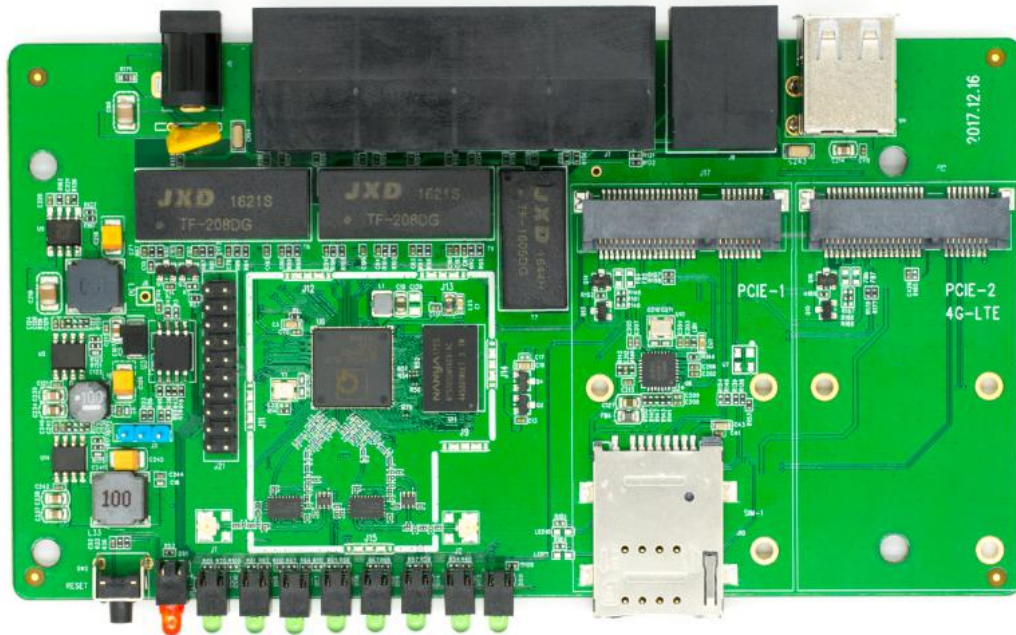
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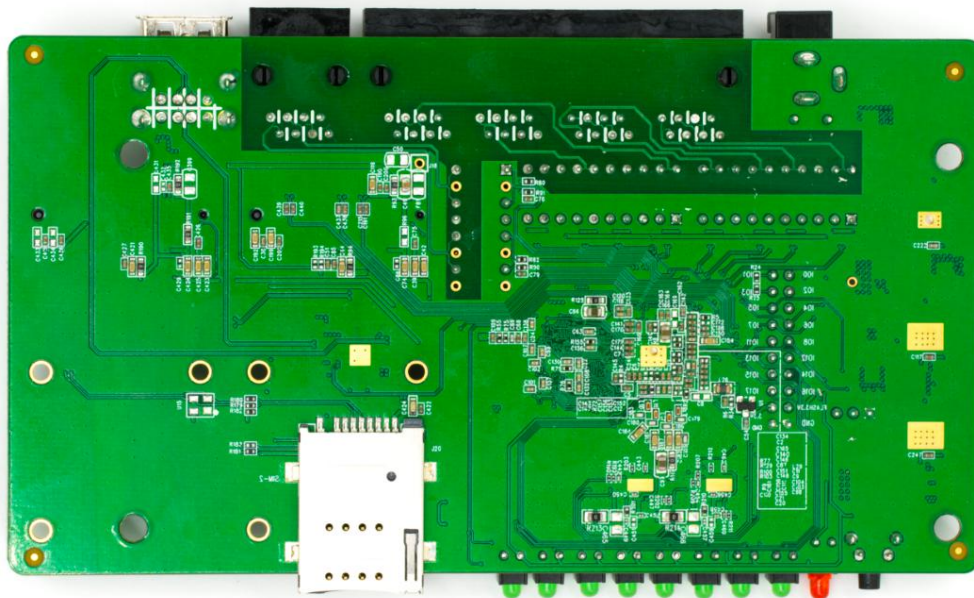
## PCBA PICTURES

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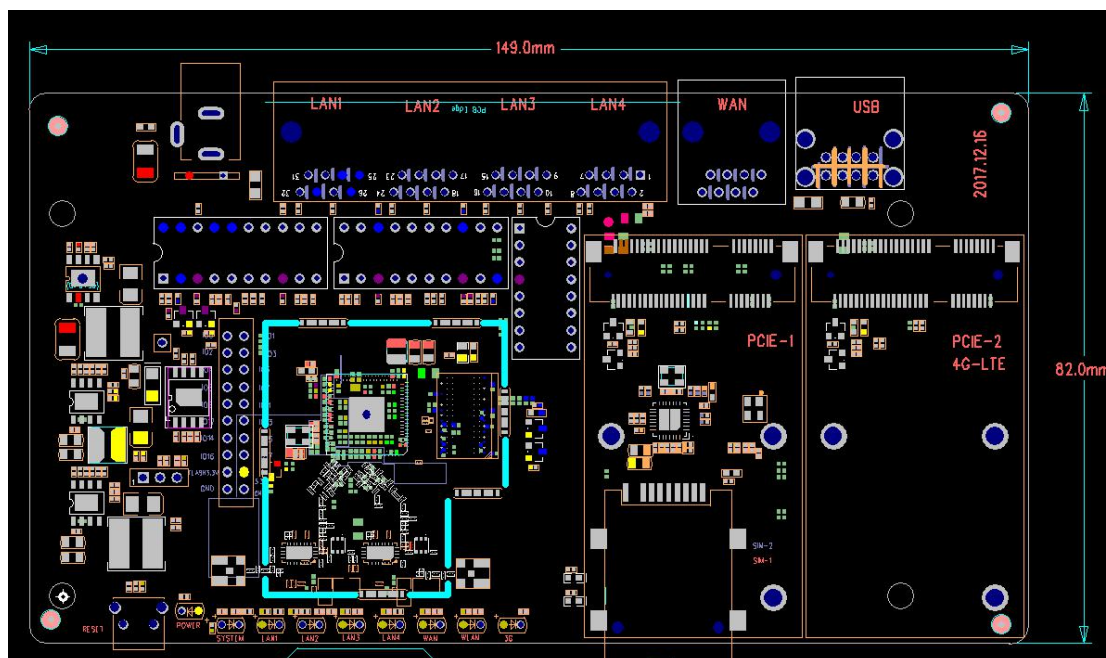
**Positive Side:**



**Negative Side:**



## SIZE MARKING





## RF PERFORMANCE(HP: HIGH POWER)

QCA9531 RF0 Test Report				
802.11 g 54Mbps	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2412	-30.1	23.2	0.5	-75
2437	-32.1	22.8	0.5	-75
2462	-34.0	22.4	0.5	-75
802.11 n HT20 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2412	-31.2	22.1	0.5	-72
2437	-31.5	21.3	0.5	-72
2462	-30.6	21.2	0.5	-72
802.11 n HT40 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2422	-30.8	22.4	0.5	-68
2442	-31.4	21.6	0.5	-68
2462	-30.7	22.0	0.5	-68

QCA9531 RF1 Test Report				
802.11 g 54Mbps	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2412	-31.7	23.2	0.5	-75
2437	-33.3	23.1	0.5	-75
2462	-34.0	22.3	0.5	-75
802.11 n HT20 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2412	-31.0	22.0	0.5	-72
2437	-31.9	21.3	0.5	-72
2462	-30.3	21.0	0.5	-72
802.11 n HT40 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2422	-29.6	22.6	0.5	-68
2442	-29.5	21.6	0.5	-68
2462	-30.9	21.4	0.5	-68



## RF PERFORMANCE(NP: NORMAL POWER)

QCA9531 RF0 Test Report				
802.11 g 54Mbps	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2412	-35.1	14.9	0.5	-72
2437	-33.1	14.9	0.5	-72
2462	-32.2	14.9	0.5	-72
802.11 n HT20 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2412	-33.0	13.6	0.5	-69
2437	-31.2	13.5	0.5	-69
2462	-30.2	13.9	0.5	-69
802.11 n HT40 MCS-7	TX EVM(dB)	TX Power(dBm)	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2422	-32.4	12.7	0.5	-65
2442	-29.9	12.2	0.5	-65
2462	-30.9	12.5	0.5	-65

QCA9531 RF1 Test Report				
802.11 g 54Mbps	TX EVM(dB)	TX Power(dBm) $\pm 2$ dBm	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2412	-30.4	14.9	0.5	-72
2437	-29.5	14.9	0.5	-72
2462	-28.5	15.0	0.5	-72
802.11 n HT20 MCS-7	TX EVM(dB)	TX Power(dBm) $\pm 2$ dBm	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2412	-30.2	14.1	0.5	-69
2437	-29.9	14.0	0.5	-69
2462	-28.6	14.1	0.5	-69
802.11 n HT40 MCS-7	TX EVM(dB)	TX Power(dBm) $\pm 2$ dBm	TX Freq Error(ppm)	RX Sensitivity(dBm) 10% PER
2422	-29.0	13.3	0.5	-65
2442	-29.6	13.0	0.5	-65
2462	-29.0	12.9	0.5	-65

**ENVIRONAMENT**

Power Supply	12V 2A
Operating Temperature	0°C ~ 70°C/-40°C ~ 85°C
Storage Temperature	-40°C ~ 70°C
Operating Humidity	10%~90% non-condensing
Storage Humidity	Storage Humidity: 5%~90% non-condensing