



PRODUCT SPECIFICATION

Version 2.1

IEEE 802.11 b/g/n 1T1R USB Module

Model Number: WF75RL1510C

P/N: 07-MT7601-MA0G

CMIIT ID: 2014DP6213

2.4G channel: 1-13

(Media Tek MT7601U)

客户认可 Custom Approval Section	
Custom Name	
Department	
Approval	Date:

拟制 DESIGN	审核 CHECK	批准 APPROVAL
高照	陈宇科	熊运自
20151210	20151210	20151210

惠州高盛达科技有限公司
HUIZHOU GAOSHENGDA TECHNOLOGY CO.,LTD

中国惠州仲恺高新技术开发区华宇路 75 号

HUA YU RD., NO.75, ZHONGKAI HIGH-TECH DEVELOPMENT AREA, HUIZHOU, CHINA

TEL: (0752) 2096628

E-mail: gaoz@gaosd.cn



Document revision history

Rev.	Date	Author	Reason for Changes
Version 1.0	2014-09-03		Draft
Version 1.1	2014-09-16		Adding shield cover
Version 1.2	2014-12-18		Adding P/N No.
Version 1.3	2015-01-27		Adding CMIIT ID Update the label info
Version 1.4	2015-09-20		Edited 11b frequency range
Version 2.0	2015-12-10		PowerEN edited
Version 2.1	2016-01-06		GI edited+ FCC Statement



1. Brief Description

This document is to specify the product requirements for 802.11 b/g/n USB Module. This Module is based on Media Tek MT7601U chipset that complied with IEEE 802.11g, IEEE 802.11b, IEEE 802.11n standard from 2.4G-2.5GHz, and it can be used to provide up to 54Mbps for 802.11g, 11Mbps for 802.11b and 150Mbps for 802.11n to connect your wireless LAN.

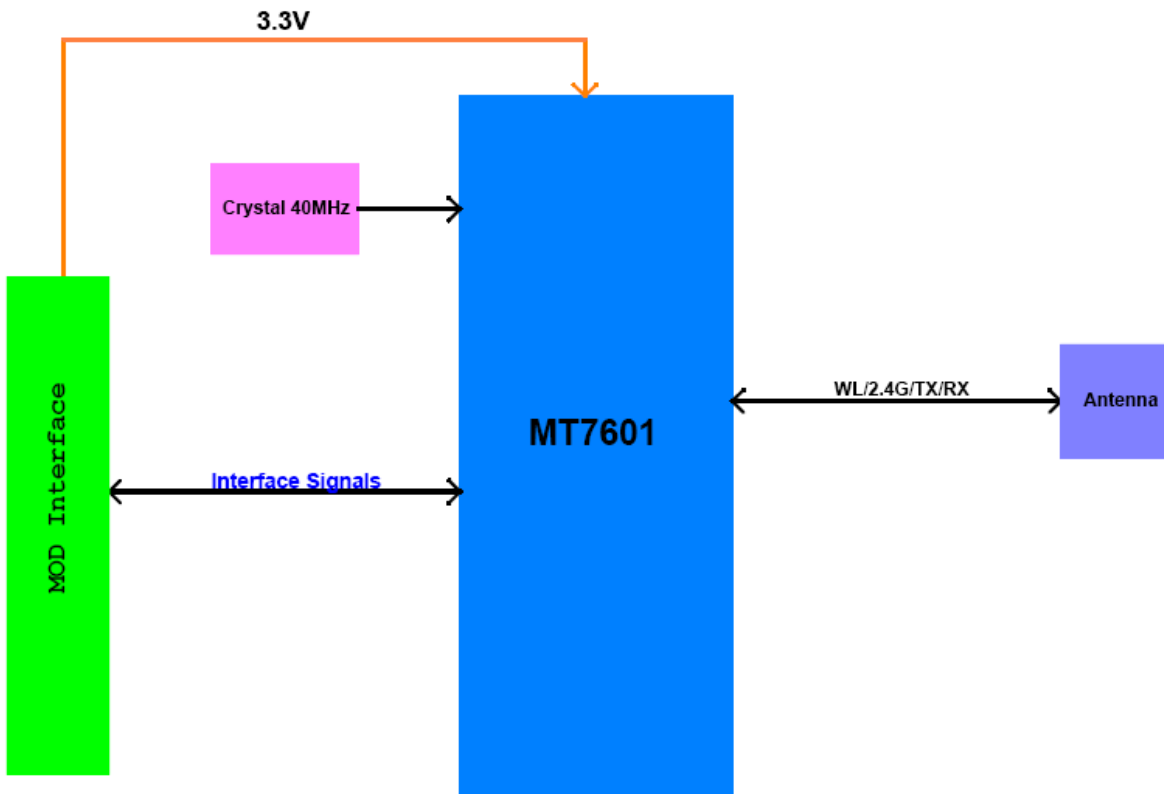
With seamless roaming, fully interoperability and advanced security with WEP standard, 802.11b/g/n USB Module offers absolute interoperability with different vendors 802.11 b, 802.11 g, 802.11n Access Points through the wireless LAN.

2. Features

- Compatible with IEEE 802.11b standard to provide wireless 11Mbps data rate.
- Compatible with IEEE 802.11g standard to provide wireless 54Mbps data rate.
- Compatible with IEEE 802.11n standard to provide wireless 150Mbps data rate.
- Operation at 2.4G-2.5GHz frequency band to meet worldwide regulations
- Supports WEP ,WPA ,WPA2,TKIP,AES enhanced security
- Drivers support Windows XP 32/64, 2000, 7,Vista 32/64, linux OS
- High speed USB 2.0 interface
- ROHS compliant

3. Application Diagrams

3.1 Functional Block Diagram



3.2 General Requirements

3.2.1 IEEE 802.11b Section

	Feature	Detailed Description
3.2.1.1	Standard	<ul style="list-style-type: none"> IEEE 802.11b
3.2.1.2	Radio and Modulation Schemes	<ul style="list-style-type: none"> DQPSK , DBPSK , DSSS , and CCK
3.2.1.3	Operating Frequency	<ul style="list-style-type: none"> 2400 ~ 2483.5MHz ISM band
3.2.1.4	Channel Numbers	<ul style="list-style-type: none"> 11 channels for United States 13 channels for Europe Countries 14 channels for Japan
3.2.1.5	Data Rate	<ul style="list-style-type: none"> 11,5.5,2,and 1Mbps
3.2.1.6	Media Access Protocol	<ul style="list-style-type: none"> CSMA/CA with ACK
3.2.1.7	Transmitter Output Power at Antenna Connector	<ul style="list-style-type: none"> Typical RF Output Power at each RF chain,Data Rate and at room Temp. 25degree C 17dBm (± 2dB) at 1,2,5.5,11Mbps



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3.2.1.8	Receiver Sensitivity at Antenna Connector	<ul style="list-style-type: none"> • Typical Sensitivity at Which Frame(1000-byte PDUs)Error Rate=8% • -76 dBm at 2Mbps • -76 dBm for 11Mbps
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3.2.2 IEEE 802.11g Section

	Feature	Detailed Description
3.2.2.1	Standard	<ul style="list-style-type: none"> • IEEE 802.11g
3.2.2.2	Radio and Modulation Type	<ul style="list-style-type: none"> • QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.2.3	Operating Frequency	<ul style="list-style-type: none"> • 2400 ~ 2483.5MHz ISM band
3.2.2.4	Channel Numbers	<ul style="list-style-type: none"> • 11 channels for United States • 13 channels for Europe Countries • 13 channels for Japan
3.2.2.5	Data Rate	<ul style="list-style-type: none"> • 6, 9, 12, 18, 24, 36, 48, 54Mbps
3.2.2.6	Media Access Protocol	<ul style="list-style-type: none"> • CSMA/CA with ACK
3.2.2.7	Transmitter Output Power at Antenna Connector	<ul style="list-style-type: none"> • Typical RF Output Power(tolerance ± 2dB) at each RF chain, Data Rate and at roomTemp. 25degree C • +17 dBm at 6, 9Mbps • +16 dBm at 12,18Mbps • +15 dBm at 24,36Mbps • +14 dBm at 48,54Mbps
3.2.2.8	Receiver Sensitivity at Antenna Connector	<ul style="list-style-type: none"> • Typical Sensitivity at each RF chain. Frame(1000-byte PDUs)Error Rate<10% at room Temp 25 degree C • -82 dBm at 6Mbps • -81 dBm at 9Mbps • -79 dBm at 12Mbps • -77 dBm at 18Mbps • -74 dBm at 24Mbps • -70 dBm at 36Mbps • -66 dBm at 48Mbps • -65 dBm at 54Mbps

3.2.3 IEEE 802.11n Section

	Feature	Detailed Description
3.2.3.1	Standard	<ul style="list-style-type: none"> • IEEE 802.11n
3.2.3.2	Radio and Modulation Type	<ul style="list-style-type: none"> • BPSK , QPSK , 16QAM ,64QAM with OFDM
3.2.3.3	Operating Frequency	<ul style="list-style-type: none"> • 2400 ~ 2483.5MHz
3.2.3.4	Data Rate(Mbps)	



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MCS	GI=800ns		GI=400ns	
	20MHz	40MH	20MHz	40MHz
0	6.5	13.5	7.2	15
1	13	27	14.4	30
2	19.5	40.5	21.7	45
3	26	54	28.9	60
4	39	81	43.3	90
5	52	108	57.8	120
6	58.5	121.5	65.0	135
7	65	135	72.2	150
8	13	27	14.444	30
9	26	54	28.889	60
10	39	81	43.333	90
11	52	108	57.778	120
12	78	162	86.667	180
13	104	216	115.556	240
14	117	243	130.000	170
15	130	270	144.444	300

3.2.3.5	Media Access Protocol	<ul style="list-style-type: none"> CSMA/CA with ACK
3.2.3.6	Transmitter Output Power at Antenna Connector	<ul style="list-style-type: none"> Typical RF Output Power(tolerance ± 2dB) at each RF chain,Data Rate and at roomTemp. 25degree C HT-20 <ul style="list-style-type: none"> 14 ± 2dBm at MCS0~15 HT-40 <ul style="list-style-type: none"> 14 ± 2dBm at MCS0~15
3.2.3.7	Receiver Sensitivity at Antenna Connector	<ul style="list-style-type: none"> Typical Sensitivity at Which Frame (1000-byte PDUs) Error Rate=10% and at roomTemp. 25degree C HT-20 <ul style="list-style-type: none"> -82dBm at MCS0/8 -79dBm at MCS1/9 -77dBm at MCS2/10 -74dBm at MCS3/11 -70dBm at MCS4/12 -66dBm at MCS5/13 -65dBm at MCS6/14 -64dBm at MCS7/15 HT-40 <ul style="list-style-type: none"> -79dBm at MCS0/8 -76dBm at MCS1/9 -74dBm at MCS2/10 -71dBm at MCS3/11 -67dBm at MCS4/12 -63dBm at MCS5/13 -62dBm at MCS6/14 -61dBm at MCS7/15



4. Electrical and Thermal Characteristics

4.1 Temperature Limit Ratings

Parameter	Minimum	Maximum	Units
Storage Temperature	-40	+80	°C
Ambient Operating Temperature	0	60	°C
Junction Temperature	0	125	°C

4.2 General Section

	Feature	Detailed Description
5.2.1	Antenna Type	<ul style="list-style-type: none">Integrated antenna
5.2.2	Operating Voltage	<ul style="list-style-type: none">5.0V ± 10%
5.2.3	Current Consumption	<ul style="list-style-type: none">230mA at continuous transmit mode190mA at receive mode w/o receiving packet
5.2.4	USB	<ul style="list-style-type: none">High Speed USB2.0 Interface

4.3 Software Requirements

Driver	Windows XP 32/64, 2000, 7, Vista 32/64, linux OS
Security	WEP, WPA, WPA2, TKIP, AES

4.3.1 Information

	Feature	Detailed Description
4.3.1.1	General Information	<ul style="list-style-type: none">General Information shows the name of Wireless Adapter, Adapter MAC Address, Regulatory Domain, Firmware Version, and Utility Version.
4.3.1.2	Current Link Information	<ul style="list-style-type: none">Current Link Information shows the C
4.3.1.3	Site survey	<ul style="list-style-type: none">To search the neighboring access points and display the information of all access points.



4.3.2 Mechanical Requirements

	Feature	Detailed Description
4.3.2.1	Length	<ul style="list-style-type: none">• 36mm(PCB)
4.3.2.2	Width	<ul style="list-style-type: none">• 22mm(PCB)
4.3.2.3	Height	<ul style="list-style-type: none">• 1.0mm(PCB)

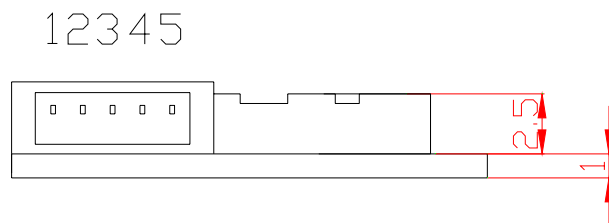
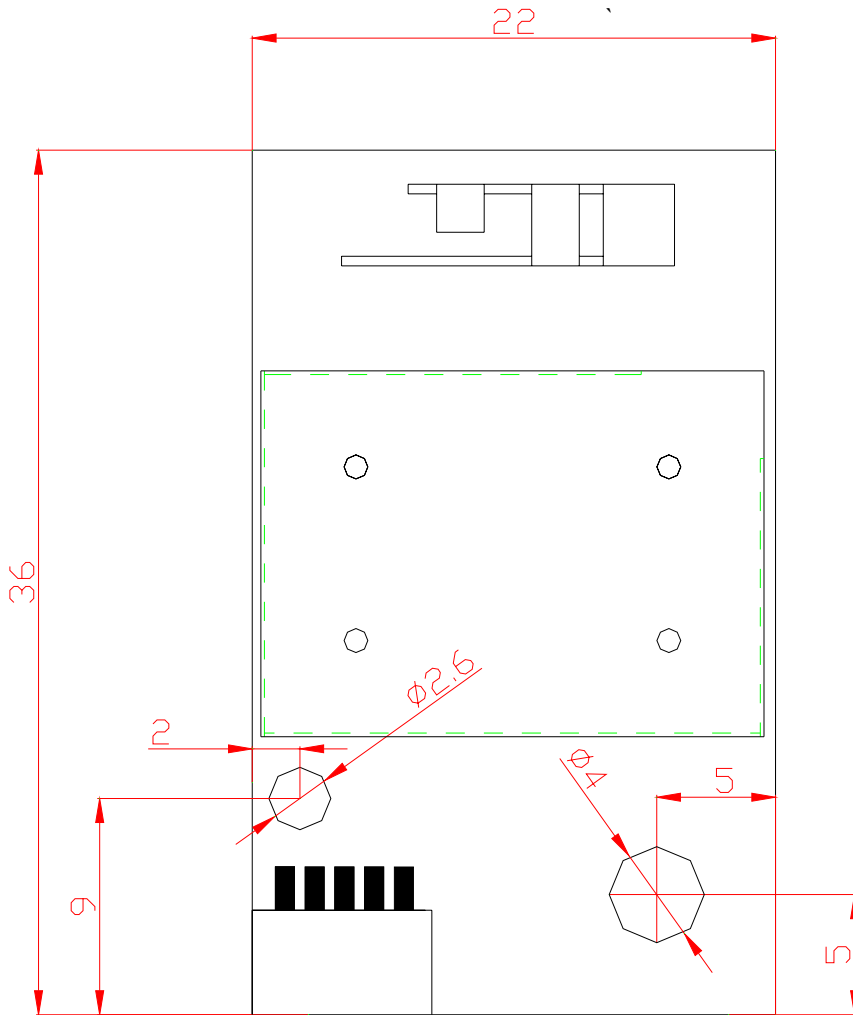
4.3.3 Environmental Requirements

	Feature	Detailed Description
4.3.3.1	Operating Temperature Conditions	<ul style="list-style-type: none">• The product is capable of continuous reliable operation when operating in ambient temperature of 0°C to +45°C .
4.3.3.2	Non-Operating Temperature Conditions	<ul style="list-style-type: none">• Neither subassemblies is damaged nor the operational performance is degraded when restored to the operating temperature after exposing to storage temperature in the range of -20°C to +75°C .
4.3.3.3	Operating Humidity conditions	<ul style="list-style-type: none">• The product is capable of continuous reliable operation when subjected to relative humidity in the range of 10% and 90% non-condensing.
4.3.3.4	Non-Operating Humidity Conditions	<ul style="list-style-type: none">• The product is not damaged nor the performance is degraded after exposure to relative humidity ranging from 5% to 95% non-condensing

5 Connector Definition

1, 5-Pin 1.25mm connector (Horizontal Type)

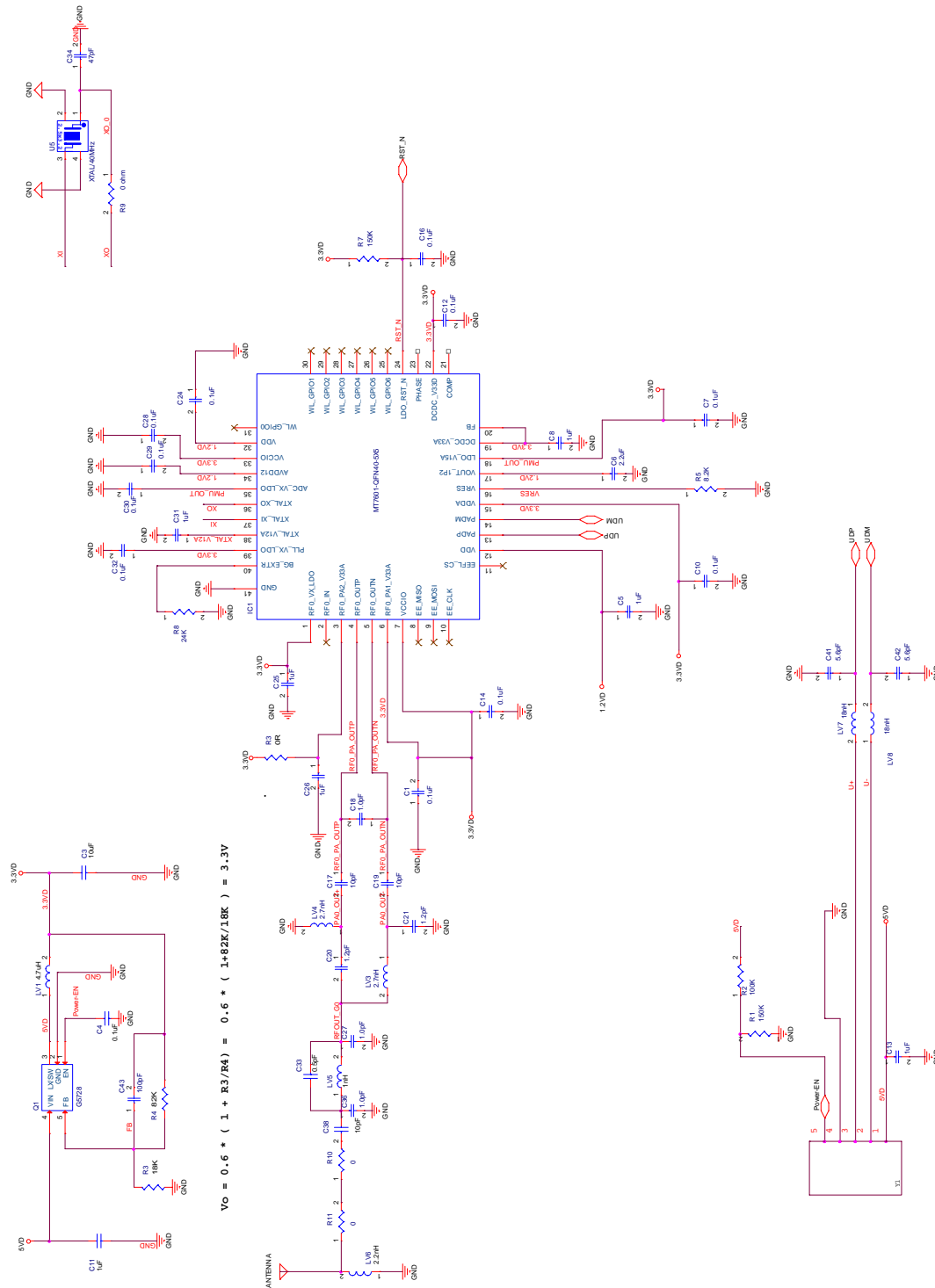
Pin	1	2	3	4	5
Definition	Power-en	GND	D+	D-	Vcc



*TOLERANCES ARE +/-0.5mm UNLESS OTHERWISE SPECIFIED

*UNIT:mm

Appendix 1 : Schematic



Appendix 2 : SMT connector

RoHS管理規定:
 1、禁止使用含有RoHS指令所限制的物质。
 2、对应的SCS或ITS出具的ICP-AES数据，不可测定物质的成分表，有效期一年。

技术指析:
 1、塑件表面应光滑、无毛刺、明显收缩、缺陷、裂纹等现象；
 2、温度范围：-25° C~85° C；
 3、额定电压：50V, AC, DC(等效)；
 4、接触电阻： $\leq 0.03\Omega$ ；
 5、绝缘电阻： $\geq 100M\Omega$ ；
 6、耐压：500V, AC/minute-
 7、符合线规:AWG#26-AWG#30 (线径0.7-1.0mm)。

料号	料号	料号	料号
1	2	3	4
GH-02AMB	GH-03AMB	GH-04AMB	GH-05AMB
GH-06AMB	GH-07AMB	GH-08AMB	GH-09AMB
GH-10AMB	GH-11AMB	GH-12AMB	GH-13AMB
GH-14AMB	GH-15AMB	GH-16AMB	GH-17AMB
GH-18AMB	GH-19AMB	GH-20AMB	GH-21AMB
GH-22AMB	GH-23AMB	GH-24AMB	GH-25AMB
GH-26AMB	GH-27AMB	GH-28AMB	GH-29AMB
GH-30AMB	GH-31AMB	GH-32AMB	GH-33AMB
GH-34AMB	GH-35AMB	GH-36AMB	GH-37AMB
GH-38AMB	GH-39AMB	GH-40AMB	GH-41AMB
GH-42AMB	GH-43AMB	GH-44AMB	GH-45AMB
GH-46AMB	GH-47AMB	GH-48AMB	GH-49AMB
GH-50AMB	GH-51AMB	GH-52AMB	GH-53AMB
GH-54AMB	GH-55AMB	GH-56AMB	GH-57AMB
GH-58AMB	GH-59AMB	GH-60AMB	GH-61AMB
GH-62AMB	GH-63AMB	GH-64AMB	GH-65AMB
GH-66AMB	GH-67AMB	GH-68AMB	GH-69AMB
GH-70AMB	GH-71AMB	GH-72AMB	GH-73AMB
GH-74AMB	GH-75AMB	GH-76AMB	GH-77AMB
GH-78AMB	GH-79AMB	GH-80AMB	GH-81AMB
GH-82AMB	GH-83AMB	GH-84AMB	GH-85AMB
GH-86AMB	GH-87AMB	GH-88AMB	GH-89AMB
GH-90AMB	GH-91AMB	GH-92AMB	GH-93AMB
GH-94AMB	GH-95AMB	GH-96AMB	GH-97AMB
GH-98AMB	GH-99AMB	GH-100AMB	GH-101AMB
GH-102AMB	GH-103AMB	GH-104AMB	GH-105AMB
GH-106AMB	GH-107AMB	GH-108AMB	GH-109AMB
GH-110AMB	GH-111AMB	GH-112AMB	GH-113AMB
GH-114AMB	GH-115AMB	GH-116AMB	GH-117AMB
GH-118AMB	GH-119AMB	GH-120AMB	GH-121AMB
GH-122AMB	GH-123AMB	GH-124AMB	GH-125AMB
GH-126AMB	GH-127AMB	GH-128AMB	GH-129AMB
GH-130AMB	GH-131AMB	GH-132AMB	GH-133AMB
GH-134AMB	GH-135AMB	GH-136AMB	GH-137AMB
GH-138AMB	GH-139AMB	GH-140AMB	GH-141AMB
GH-142AMB	GH-143AMB	GH-144AMB	GH-145AMB
GH-146AMB	GH-147AMB	GH-148AMB	GH-149AMB
GH-150AMB	GH-151AMB	GH-152AMB	GH-153AMB
GH-154AMB	GH-155AMB	GH-156AMB	GH-157AMB
GH-158AMB	GH-159AMB	GH-160AMB	GH-161AMB
GH-162AMB	GH-163AMB	GH-164AMB	GH-165AMB
GH-166AMB	GH-167AMB	GH-168AMB	GH-169AMB
GH-170AMB	GH-171AMB	GH-172AMB	GH-173AMB
GH-174AMB	GH-175AMB	GH-176AMB	GH-177AMB
GH-178AMB	GH-179AMB	GH-180AMB	GH-181AMB
GH-182AMB	GH-183AMB	GH-184AMB	GH-185AMB
GH-186AMB	GH-187AMB	GH-188AMB	GH-189AMB
GH-190AMB	GH-191AMB	GH-192AMB	GH-193AMB
GH-194AMB	GH-195AMB	GH-196AMB	GH-197AMB
GH-198AMB	GH-199AMB	GH-200AMB	GH-201AMB
GH-202AMB	GH-203AMB	GH-204AMB	GH-205AMB
GH-206AMB	GH-207AMB	GH-208AMB	GH-209AMB
GH-210AMB	GH-211AMB	GH-212AMB	GH-213AMB
GH-214AMB	GH-215AMB	GH-216AMB	GH-217AMB
GH-218AMB	GH-219AMB	GH-220AMB	GH-221AMB
GH-222AMB	GH-223AMB	GH-224AMB	GH-225AMB
GH-226AMB	GH-227AMB	GH-228AMB	GH-229AMB
GH-230AMB	GH-231AMB	GH-232AMB	GH-233AMB
GH-234AMB	GH-235AMB	GH-236AMB	GH-237AMB
GH-238AMB	GH-239AMB	GH-240AMB	GH-241AMB
GH-242AMB	GH-243AMB	GH-244AMB	GH-245AMB
GH-246AMB	GH-247AMB	GH-248AMB	GH-249AMB
GH-250AMB	GH-251AMB	GH-252AMB	GH-253AMB
GH-254AMB	GH-255AMB	GH-256AMB	GH-257AMB
GH-258AMB	GH-259AMB	GH-260AMB	GH-261AMB
GH-262AMB	GH-263AMB	GH-264AMB	GH-265AMB
GH-266AMB	GH-267AMB	GH-268AMB	GH-269AMB
GH-270AMB	GH-271AMB	GH-272AMB	GH-273AMB
GH-274AMB	GH-275AMB	GH-276AMB	GH-277AMB
GH-278AMB	GH-279AMB	GH-280AMB	GH-281AMB
GH-282AMB	GH-283AMB	GH-284AMB	GH-285AMB
GH-286AMB	GH-287AMB	GH-288AMB	GH-289AMB
GH-290AMB	GH-291AMB	GH-292AMB	GH-293AMB
GH-294AMB	GH-295AMB	GH-296AMB	GH-297AMB
GH-298AMB	GH-299AMB	GH-300AMB	GH-301AMB

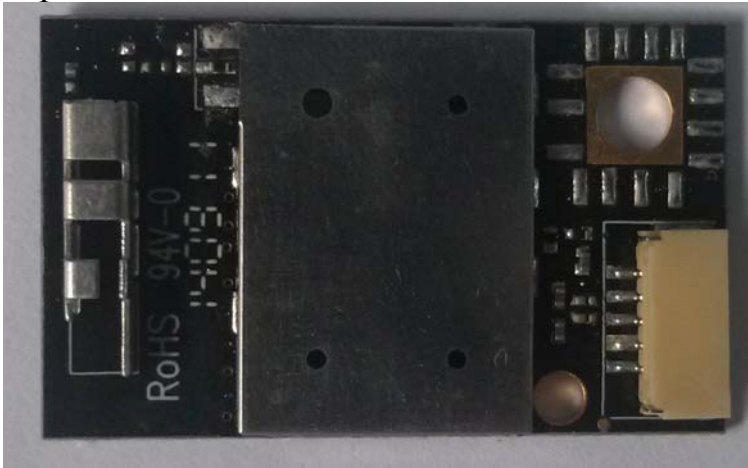
未註公差
 X.X° ±0.5° X.X° ±0.5°
 單位: mm (in)
 Design Units: METRIC
 SIZE: A4
 比例: 1 OF 1
 Part No: T125051-88-1**

GH-nAWB PCB Layout

GH-nAWB

Circuit No.1
 Connector outline
 PCB Layout

Appendix 3 : Top & Bottom vertical view



Connector view:





FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference

to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. Modular could be only used in mobile or fix device, and could not be used in any portable device. The module must be installed in TV set.

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Caution!

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user authority to operate the equipment.

Regulation information

- (1) This device and its antenna(s) must not be co-located or operating in conjunction with any other



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antenna or transmitter.

(2) This compliance to FCC radiation exposure limits for an uncontrolled environment, and minimum of 20cm separation between antenna and body.

(3)

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

(4) The end product must carry a label stating "Contains TX FCC ID: 2AC23-WF75RL1510C".