

WG208 – USB WiFi Module Datasheet

Name: 802.11b/g/n USB WiFi Module

Model NO.: WG208

Revision: V3.04

Revision History:

Revision	Description	Approved	Date
V1.01	Initial	George	20130817
V2.01	Add Ordering Information	George	20140215
V3.01	Add Reference design schematic	George	20140305
V3.02	Update Footprint	George	20151015
V3.03	Update soldering temperature	George	20160419
V3.04	Update certification information	George	20170831

General Description

WG208 is a 802.11n/ b/g WiFi one-stream USB interface designed specifically to provide enhanced WiFi performance and value for home gateways, set-top boxes, gaming consoles, printers, IP cameras, and variety of other products that host processors not originally intended to support WiFi functions. WG208's MT7601 single-chip features a new architecture that integrates both a CPU and memory to run more of the WiFi function on-chip. The integrated CPU offloads the wireless processing overhead from the host appliance and enables consumer electronic devices to support WiFi functions seamlessly without change of original host processors.

Applications

- Desktop Computer
- Laptop Computer,
- IP Camera
- IP TV
- IP DVD(Internet VOD Player)
- Set Top Box
- Home Gateways
- Gaming Consoles
- Printers



Figure 1: WG208 Top View

Features

- Compliant to IEEE 802.11b/g/n WLANs
- 2.4 GHz WLAN MAC/BB processing
- Security: WEP 64/128, WPA, WPA2, TKIP, AES, WAPI
- Supports for Windows XP 32/64, 2000, Vista 32/64bit, Windows 7 32/64bit, Linux, Android.
- Supported Linux kernel AP/Station drivers
- USB 2.0 high speed interface.
- Supports 72 Mbps for 20 MHz and 150 Mbps for 40 MHz channel operations.
- RoHS compliance meets environment-friendly requirement.
- FCC,CE compliance
- 18.3(L) x 12.6(W) x 2.8(H) mm small dimension

Applications Block Diagram

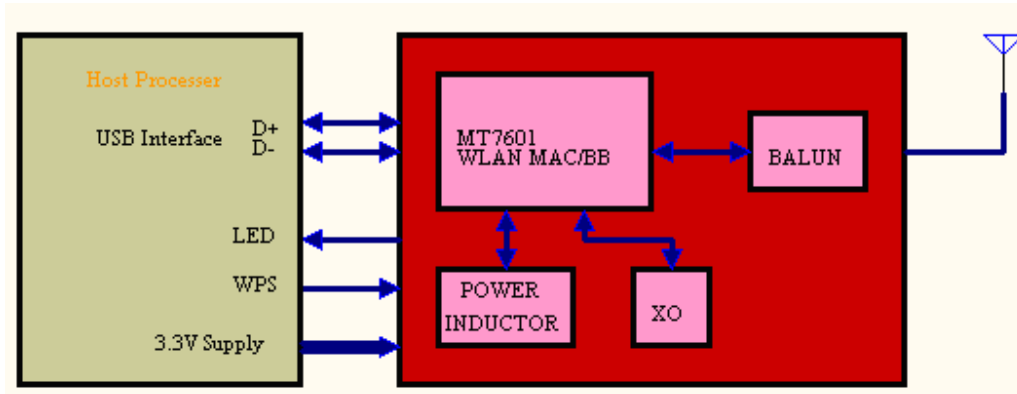


Figure 2: WG208 Block Diagram

Ordering Information

Module NO.	RF Connector Type	Antenna Option
WG208_E	IPEX Connector	Ext Antenna
WG208_P	PCB PIN	Ext Antenna

Performance Specification

Wireless Specifications

Model	WG208
Antenna Type	IPEX connector or PCB pin
Standard Conformance	802.11b, 802.11g, and 802.11n
Frequency Range	USA: 2.400 ~ 2.483GHz
	Europe: 2.400 ~ 2.483GHz
	Japan: 2.400 ~ 2.497GHz
	China: 2.400 ~ 2.483GHz
Modulation Technique	DSSS with CCK, DQPSK, DBPSK
	OFDM with BPSK, QPSK, 16QAM, 64QAM
Channel Spacing	5MHz/20MHz/40MHz
Data Rate	802.11b: 1, 2, 5.5 and 11Mbps
	802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps
	802.11n: 20MHz channel: 1Nss: 65Mbps @ 800GI, 72.2Mbps @ 400GI (Max.)
	40MHz channel: 1Nss: 135Mbps @ 800GI, 150Mbps @ 400GI (Max.)
Operating	USA/Canada: 11 (1~11)

Channels	Major Europe Countries: 13 (1~13)
	France: 4 (10~13)
	Japan: 14 for 802.11b (1~13 or 14th), 13 for 802.11g (1~13)
	China: 13 (1~13)
Wi-Fi Compliance	Wi-Fi 2.4GHz by request
Security	64/128/152-bit WEP encryption
	WPA/WPA2 encryption
	AES-CCM & TKIP encryption

Transmit Power And Receive Sensitivity

Transmit Power	target power tolerance ± 2 dBm			
	802.11b:	+19 dBm for 802.11b CCK		
	802.11g:	+17dBm @ 6, 9, 12,18,24,36,48Mbps		
		+15dBm @ 54Mbps		
	802.11n HT20:	+15dBm @ MCS 7/15		
	802.11n HT40:	+15dBm @ MCS 7/15		
Receiver Sensitivity		Data Rate	IEEE Spec(1 Rx dBm)	Typical
	802.11b	1M	-82	-92
		5.5M	-80	-89
		11M	-76	-87
	802.11g	6M	-82	-92
		9M	-81	-92
		12M	-79	-91
		18M	-77	-90
		24M	-74	-86
		36M	-70	-83
		48M	-66	-78
		54M	-65	-76
	802.11n HT20	MCS0	-82	-92
		MCS1	-79	-91
		MCS2	-77	-90
		MCS3	-74	-85
		MCS4	-70	-82
		MCS5	-66	-79
		MCS6	-65	-75
	802.11n HT40	MCS7	-64	-73
		MCS0	-79	-88
MCS1		-76	-87	
	MCS2	-74	-86	

		MCS3	-71	-82
		MCS4	-67	-78
		MCS5	-63	-75
		MCS6	-62	-72
		MCS7	-61	-70
Operation Distance		Outdoor		Indoor
	802.11b	150m @ 11Mbps		30m @ 11Mbps
		300m @ 1Mbps		100m @ 1Mbps
	802.11g	50m @ 54Mbps		30m @ 54Mbps
		300m @ 6Mbps		100m @ 6Mbps
	802.11n HT20	30m @ 150Mbps		20m @ 150Mbps
		30m @ 65Mbps		20m @ 65Mbps
		250m @ 6.5Mbps		100m @ 6.5Mbps

Electrical Characteristics

Parameter	Symbol	Min	Max	Units
Supply Voltage	VCC_3.3	0.3	4	V
RF input (reference to 50 Ω)	RFin		10	dBm
Storage Temperature	Tstore	-40	125	°C
Junction Temperature	Tjunction		125	°C
Electrostatic Discharge Tolerance	ESD		2000	V

Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units
Supply Voltage	VCC_3.3	3	3.3	3.6	V
RF input (reference to 50 Ω)	RFin		10	dBm	dBm
Operation temperature	Toperation	-20	25	70	°C
Thermal Parameter	PsiJT			3.23	°C/W

Power Consumption for 2.4 GHz Operation

Mode	Operating Mode	VCC_3.3(mA)
HT40 @15dBm	Sleep	50
	TX	210
	RX	151
802.11g @17dBm	Sleep	50
	TX	233
	RX	151
802.11b @19dBm	Sleep	50
	TX	242
	RX	151

Note: For Tx, transmitter and synthesizer are on. Tx power at 18 dBm for 802.11b/g/HT20 and 16 dBm HT40. For Rx, receiver and synthesizer are on with maximum receiver gain.

Module Pinout

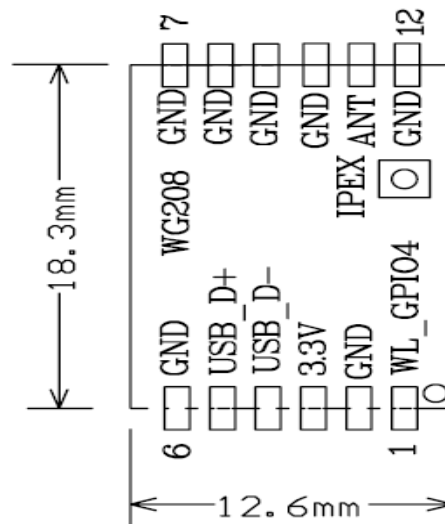


Figure 3: WG208 Pin Package

Pin Description

Pin No.	Pin name	I/O	Description	Remark
1	WL_GPIO4	I	WPS pin	
2	GND	G	Ground	
3	VCC_3.3	P	Module Power Supply	
4	USB_D-	I/O	USB Interface DM	
5	USB_D+	I/O	USB Interface DP	
6	GND	G	Ground	
7	GND	G	Ground	
8	GND	G	Ground	
9	GND	G	Ground	
10	GND	G	Ground	
11	ANT	RF	Antenna1	50 OHM
12	GND	G	Ground	

PCB Footprint and Dimensions

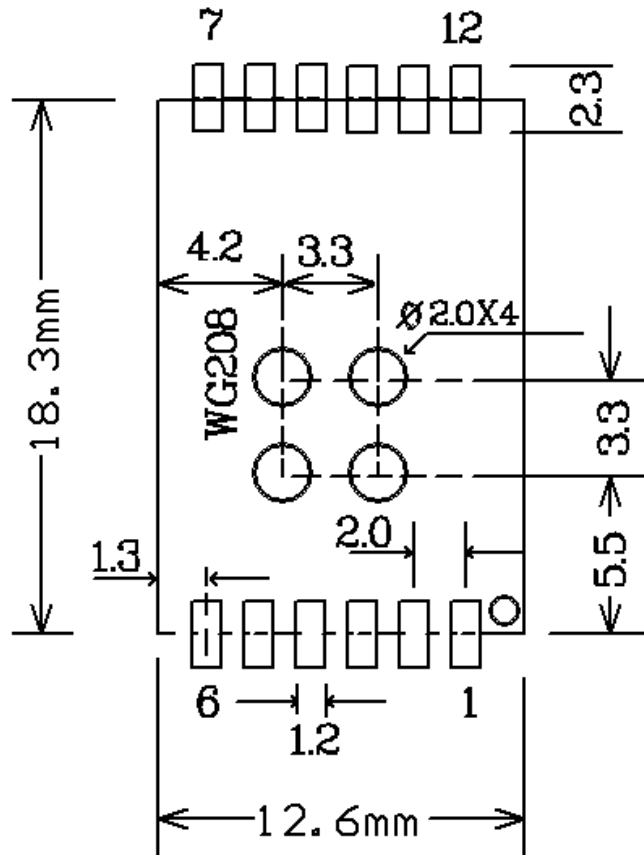


Figure 4: WG208 Footprint

Manufacturing Process Recommendations

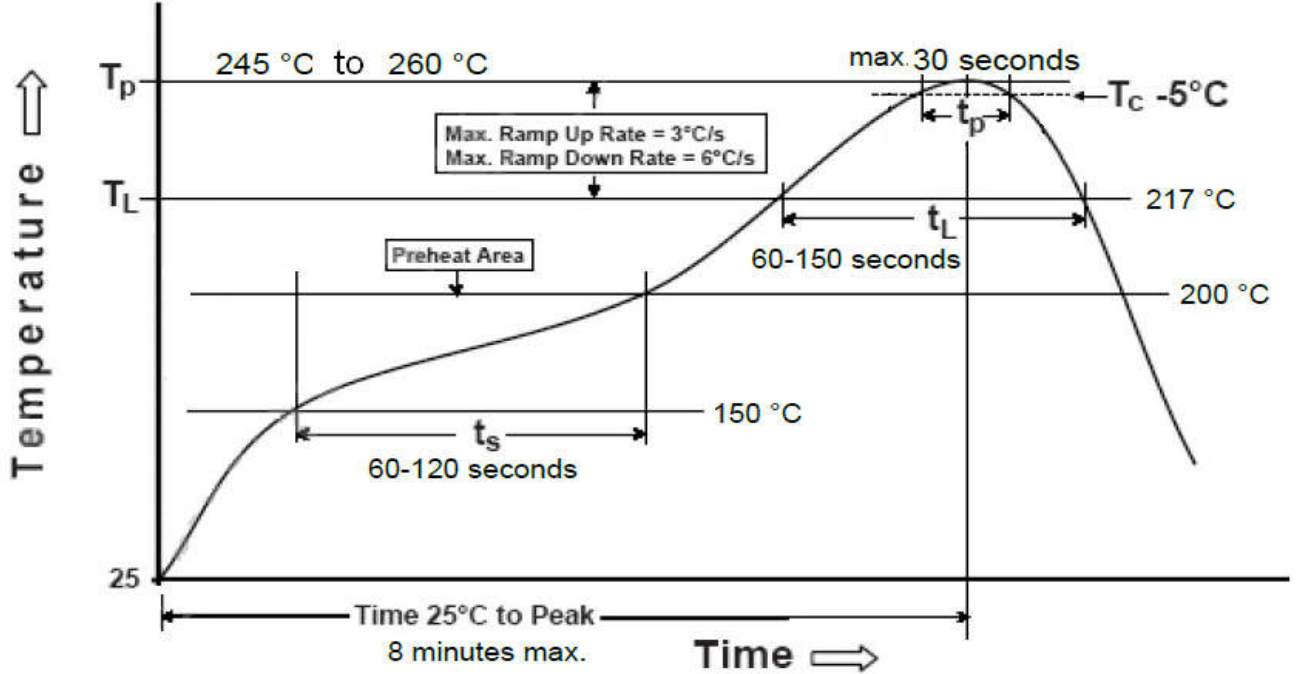


Figure 5: WG208 Typical Leadfree Soldering Profile

Note: The final soldering temperature chosen at the factory depends on additional external factors like choice of soldering paste, size, thickness and properties of the baseboard, etc. Exceeding the maximum soldering temperature in the recommended soldering profile may permanently damage the module.

Reference design schematic

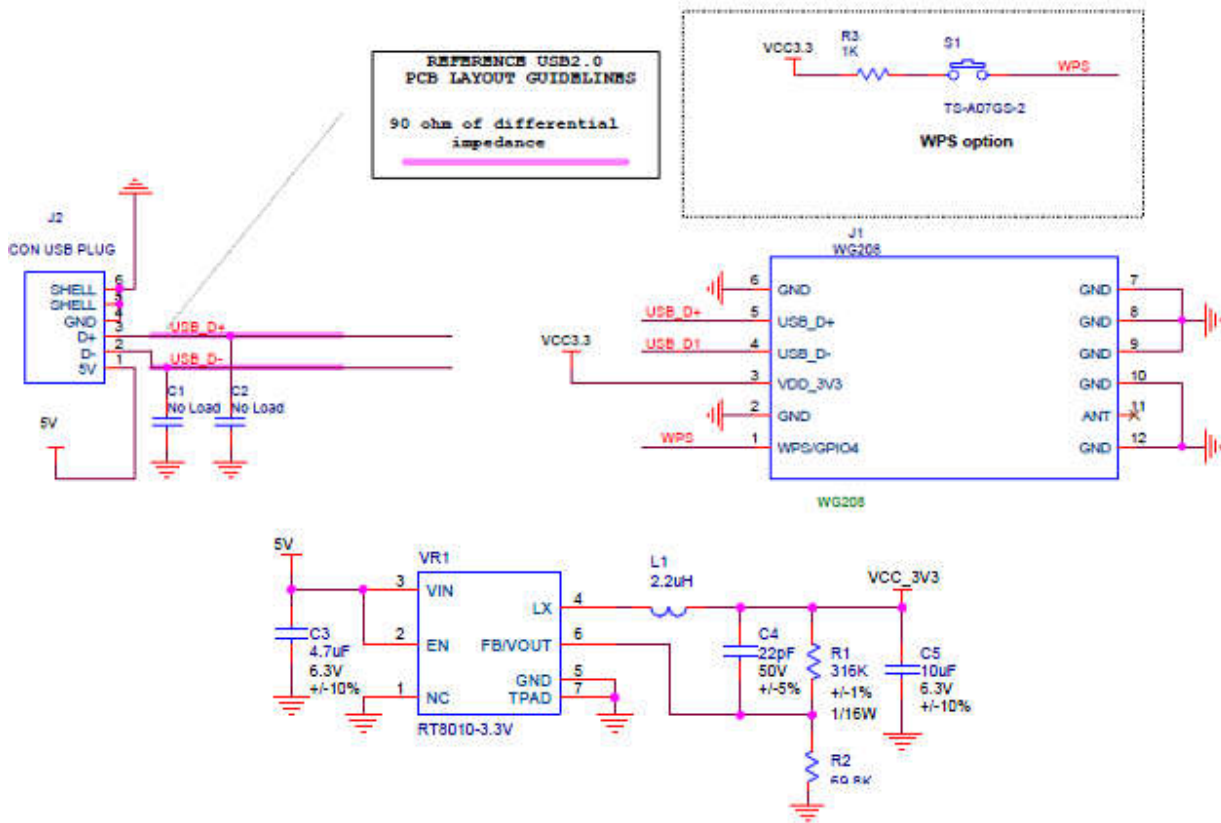


Figure6: WG208 Reference design schematic

Packaging Specification

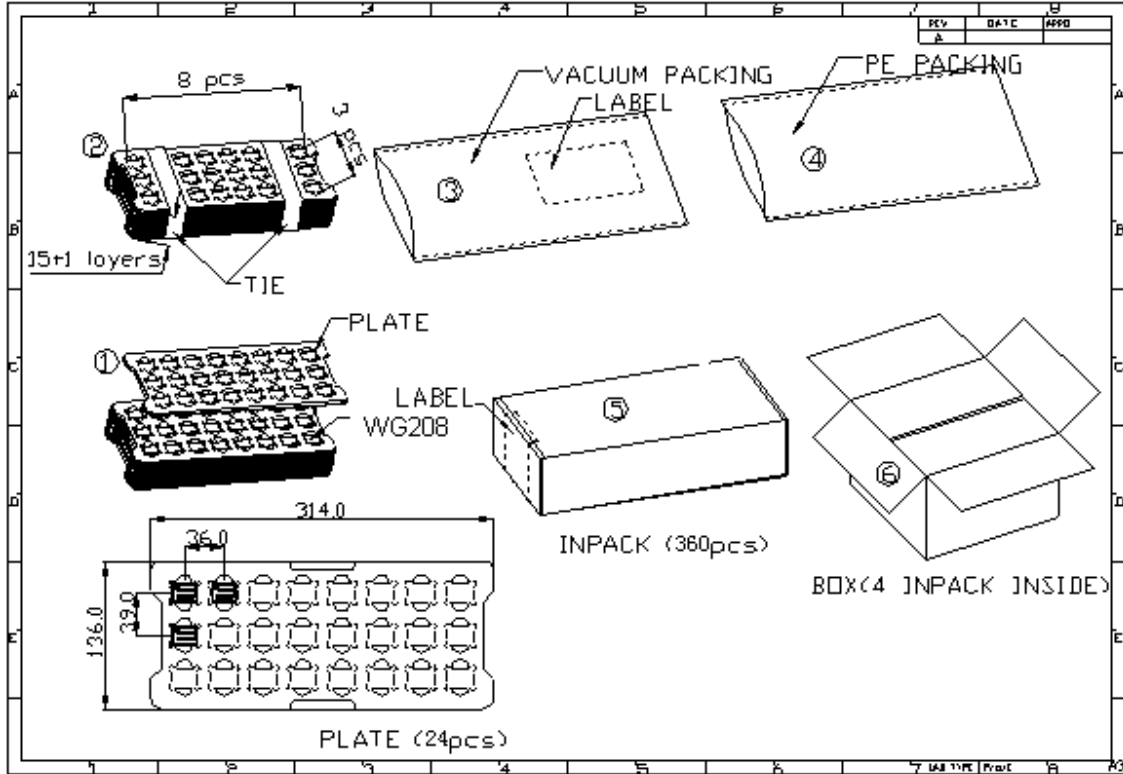


Figure 7: WG208 Packaging

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