AMPAK Technology Inc.

AMPAK

WSDB-750GN_A

Wi-Fi 802.11b/g/n+MCU

Module User's Manual

Date	Revision Content	Version
2016/6/30	-Preliminary	0.0

1. Introduction

AMPAK Technology likes to announce a low-cost and low-power consumption module which has Wi-Fi 802.11b/g/n functionalities. The highly integrated WSDB-750GN module makes the possibilities of web browsing, all types of battery powered device. With seamless roaming capabilities and advanced security, WSDB-750GN can also interact with different vendors' 802.11b/g/n Access Points in the wireless LAN.

The wireless module complies with IEEE 802.11 b/g/n standard and it can achieve up to a speed of 72.2Mbps with single stream in 802.11n draft 7.0, 54Mbps as specified in IEEE 802.11g, or 11Mbps for IEEE 802.11b to connect to the wireless LAN.

This compact module is a total solution for a combination of Wi-Fi 802.11b/g/n technologies with Microcontroller Processor. The module is specifically developed for embedded system devices.

2.General Specification

2.1 General Specification

Model Name	WSDB-750GN_A
Product Description	Wi-Fi 802.11b/g/n + MCU Module
Dimension	16 mm x 32 mm x 3.1mm ±0.5mm
Module Interface	SPI/JTAG/UART/USB/I2C/I2S
Operating temperature	-20°C to 70°C
Storage temperature	-40°C to 85°C
Humidity	Operating Humidity 10% to 95%

2.2 Voltages

2.2.1 Absolute Maximum Ratings

Symbol	Description	Min.	Max.	Unit
VDD_3V3	Power supply for SIP Module	-0.4	3.7	V

2.2.2 Recommended Operating Ratings

Symbol	Min.	Typ.	Max.	Unit
VDD_3V3	3.0	3.3	3.6	V

3.WiFi RF Specification

3.1 RF Specification

Conditions : VDD=3.3V ; Temp:25°C

Feature	Description	
WLAN Standard	IEEE 802.11b/g/n, WiFi compliant. Not support 40MHz bandwidth.	
Frequency Range	2400 MHz ~ 2483.5 MHz (2.4 GHz ISM Band)	
Number of Channels	2.4GHz：Ch1 ~ Ch11	
Modulation	802.11b : CCK, DQPSK, DBPSK 802.11 g/n : OFDM /64-QAM,16-QAM, QPSK, BPSK	
Output Power	802.11b /11Mbps : 15 dBm , typical @ EVM ≤ -9dB	
	802.11g /54Mbps : 13 dBm , typical @ EVM ≤ -25dB	
	802.11n /65Mbps : 12 dBm , typical @ EVM ≤ -28dB	
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0	PER @ -85dBm, typical
	- MCS=1	PER @ -84dBm, typical
	- MCS=2	PER @ -82dBm, typical
	- MCS=3	PER @ -80dBm, typical
	- MCS=4	PER @ -77Bm, typical
	- MCS=5	PER @ -73 dBm, typical
	- MCS=6	PER @ -71 dBm, typical
	- MCS=7	PER @ -69 dBm, typical
Receive Sensitivity (11g) @10% PER	- 6Mbps	PER @ -86Bm, typical
	- 9Mbps	PER @ -85dBm, typical
	- 12Mbps	PER @ -85dBm, typical
	- 18Mbps	PER @ -83dBm, typical
	- 24Mbps	PER @ -81dBm, typical
	- 36Mbps	PER @ -78Bm, typical
	- 48Mbps	PER @ -73dBm, typical
	- 54Mbps	PER @ -72dBm, typical
Receive Sensitivity (11b) @8% PER	- 1Mbps	PER @ -90dBm, typical
	- 2Mbps	PER @ -89Bm, typical
	- 5.5Mbps	PER @ -88 dBm, typical

	- 11Mbps PER @ -85 dBm, typical
Data Rate	802.11b : 1, 2, 5.5, 11Mbps
	802.11g : 6, 9, 12, 18, 24, 36, 48, 54Mbps
Data Rate (20MHz ,Long GI,800ns)	802.11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65Mbps
Data Rate (20MHz ,short GI,400ns)	802.11n : 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65,72.2Mbps
Maximum Input Level	802.11b : -10 dBm
	802.11g/n : -20 dBm
Antenna Reference	Internal Printed ANT :Small antennas with 0~2 dBi peak gain

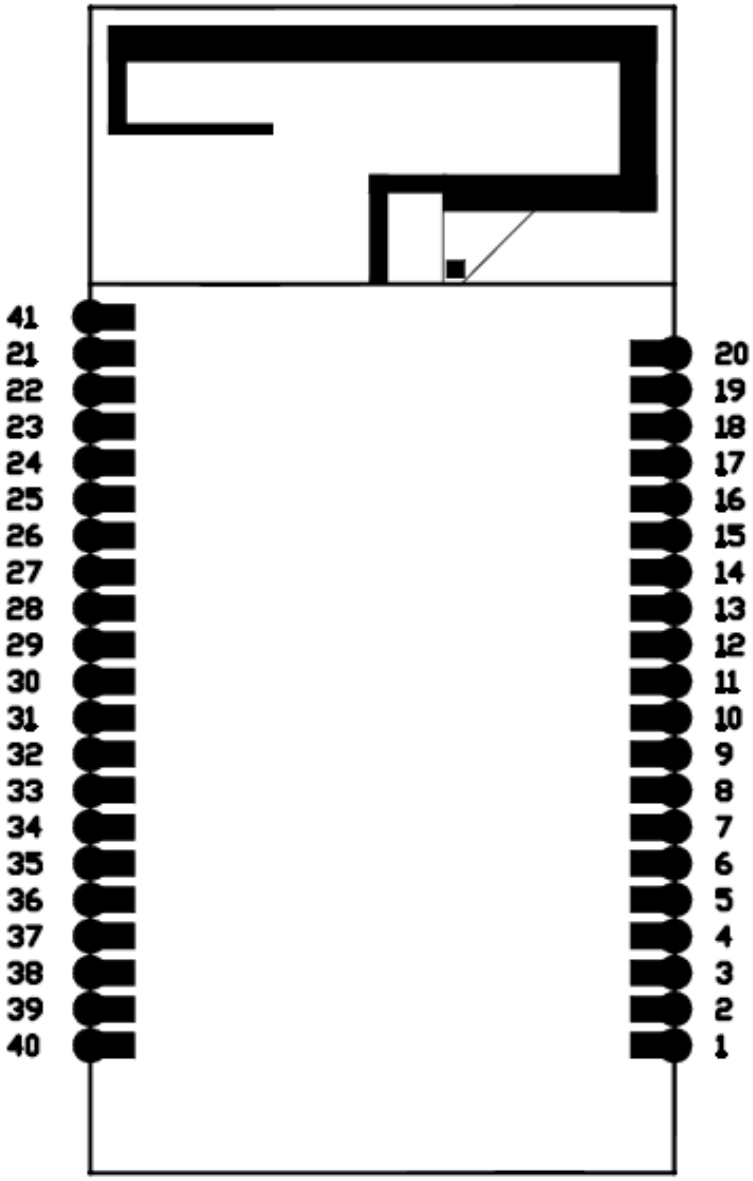
4.Warning

4.1 Federal Communication Commission

Interference Statement

To assure continued FCC compliance:
1. Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.
2. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.
This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.
Cet appareil radio est conforme au CNR-247d'Industrie Canada. L'utilisation de ce dispositif est autorisée seulement aux deux conditions suivantes : (1) il ne doit pas produire de brouillage, et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.
The final end product must be labeled in a visible area with the following: "Contains FCC ID: NHS- WSDB750GN", "contains IC: 3653A- WSDB750GN".
The grantee's FCC ID can be used only when all FCC/ IC compliance requirements are met.

5. Pin Assignment

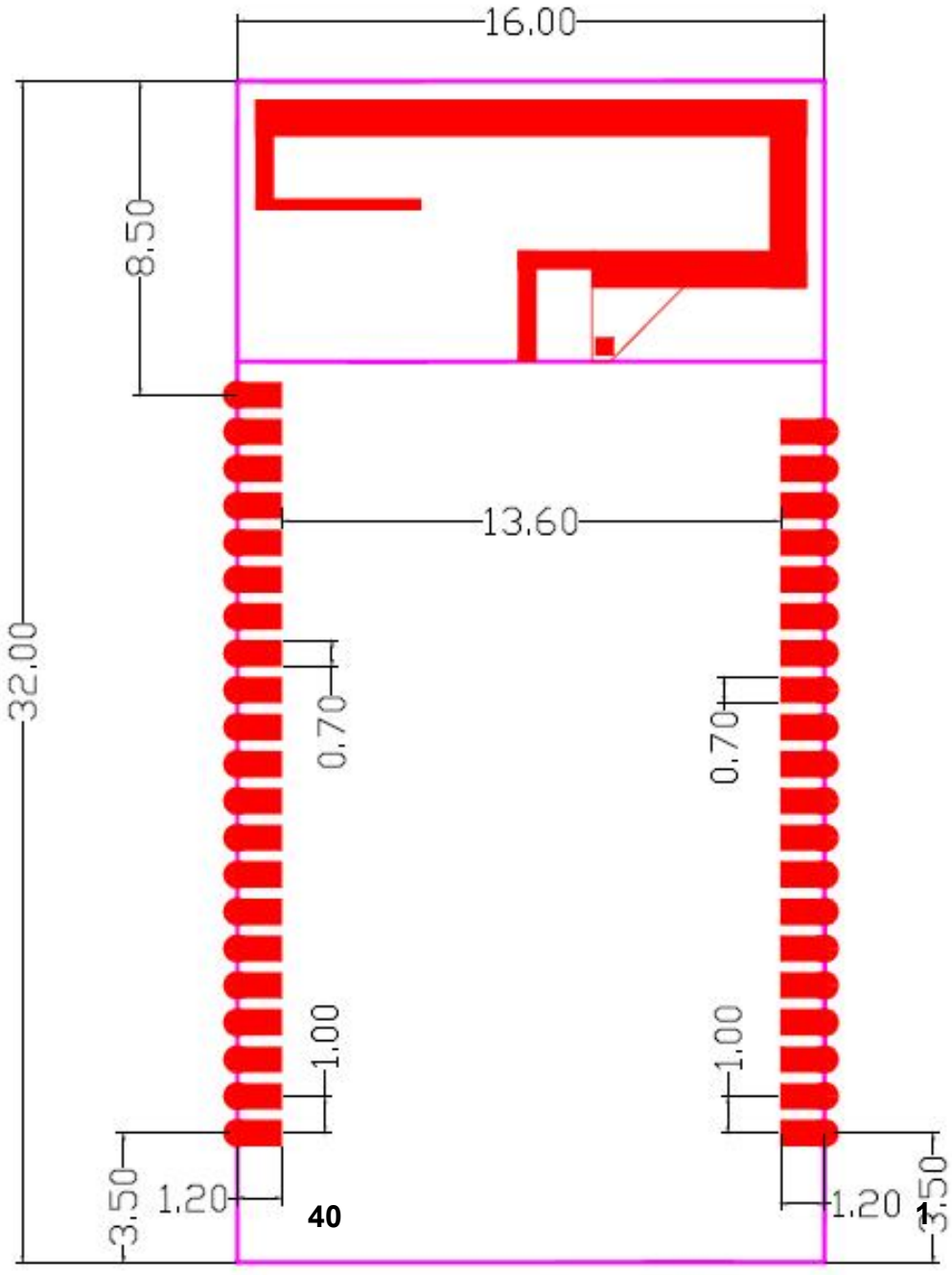


No	Name	Type	Description
1	NC	I/O	No function
2	PB2	I/O	GPIO PIN
3	NC	I/O	No function
4	SPI1_MOSI/PA7	I/O	SPI_MOSI
5	NC	I/O	No function
6	SPI1_SCK/PB3	I/O	SPI_SCK
7	SPI1_MISO/PB4	I/O	SPI_MISO
8	UART2_TX/PA2	I/O	UART transmit output/Debug port
9	PA1	I/O	GPIO PIN
10	VBAT	I	MCU operating voltage input (power supply for RTC, external clock, 32 kHz oscillator and backup registers (through power switch) when VDD is not present.)
11	NC	I/O	No function
12	UART2_RX/PA3	I/O	UART receive input/Debug port
13	MICRO_RST_N	I/O	MCU Reset
14	WAKE_UP	I/O	Wake up
15	NC	I/O	No function
16	PC13	I/O	GPIO PIN
17	I2C2_SCL/PB10	I/O	I2C_SCL
18	I2C2_SDA/PB9	I/O	I2C_SDA
19	PB12	I/O	GPIO
20	GND	—	Ground
21	GND	—	Ground
22	NC	I/O	No function
23	NC	I/O	No function
24	NC	I/O	No function
25	SWD_TCK/PA14	I/O	SWD_TCK
26	SWD_TMS/PA13	I/O	SWD_TMS
27	PA12	I/O	GPIO PIN
28	NC	I/O	No function

29	PA10	I/O	GPIO PIN
30	PB6	I/O	GPIO PIN
31	PB8	I/O	GPIO PIN
32	NC	I/O	No function
33	PB13	I/O	GPIO PIN
34	PA5	I/O	GPIO PIN
35	PA11	I/O	GPIO PIN
36	PB1	I/O	GPIO PIN
37	PB0	I/O	GPIO PIN
38	PA4	I/O	GPIO PIN
39	VDD_3V3	V	Power supply input
40	VDD_3V3	V	Power supply input
41	ANT	O	RF OUTPUT(option)

6.Dimensions

6.1 Physical Dimensions



Unit:mm

6.2 Mechanical details