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EMW3165

Data sheet

Overview

EMW3165 is a low-cost and low-power consumption module which has Wi-Fi 802.11b/g/n functionalities. The highly integrated EMW3165 module makes the possibilities of web browsing, all types of battery powered device. With seamless roaming capabilities and advanced security, EMW3165 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.

Applications

- Single-band 2.4GHz IEEE 802.11b/g/n
- Supports standard interfaces SDIO v2.0
- Integrated ARM Cortex-M3TM CPU with on-chip memory enables running IEEE802.11 firmware that can be field-upgraded with future features.
- Lead-Free / RoHS
- Single power supply voltage 3.3V
- Security:
  - Hardware WAPI acceleration engine
  - AES and TKIP in hardware for faster data encryption and IEEE 802.11i compatibility
  - WPATM - and WPA2TM - (Personal) support for powerful encryption and authentication.

Contents

1. INTRODUCTION

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2. Features

- Single-band 2.4GHz IEEE 802.11b/g/n
- Supports standard interfaces SDIO v2.0
- Integrated ARM Cortex-M3™ CPU with on-chip memory enables running IEEE802.11 firmware that can be field-upgraded with future features.
- Lead-Free / RoHS
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- Security:
  - Hardware WAPI acceleration engine
  - AES and TKIP in hardware for faster data encryption and IEEE 802.11i compatibility
  - WPA™ - and WPA2™ - (Personal) support for powerful encryption and uthentication.

A simplified block diagram of the module is depicted in the figure below.
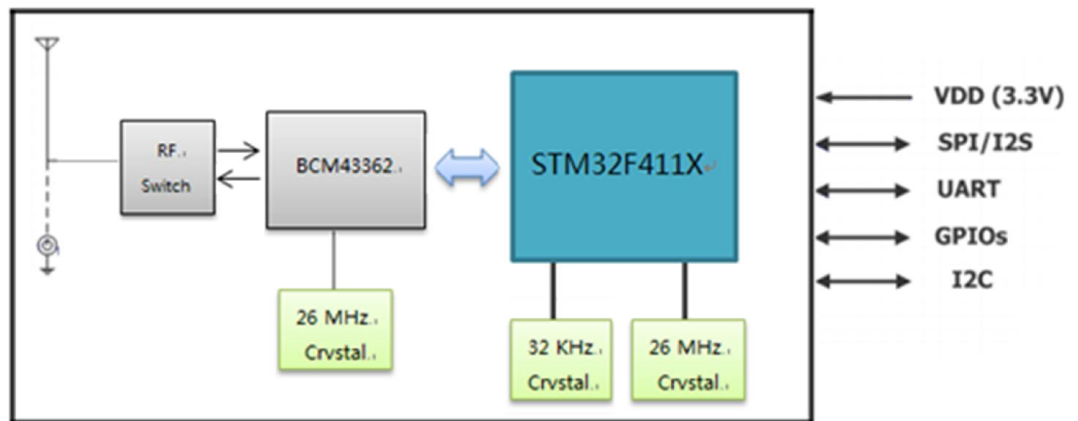
3.   General Specification

3.1.   General Specification

Model Name	EMW3165
Product Description	Wi-Fi802.11b/g/n + MCU Module
Dimension	16mmx 32mmx 2.2mm 0.5mm
Module Interface	SPI/JTAG/UART/USB/I2C/I2S
Operating temperature	-10°Cto 55°C
Storage temperature	-40°Cto 85°C
Humidity	Operating Humidity 10% to 95%

3.2.   Voltages

3.2.1.   Absolute Maximum Ratings

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

3.2.2.   Recommended Operating Ratings

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

4. WiFi RF Specification

4.1. RF Specification

Conditions :VDD=3.3V ; Temperature:25°C

Feature	Description
WLAN Standard	IEEE 802.11b/g/n, WiFicompliant
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz : Ch1 ~ Ch14
Modulation	802.11b : CCK, DQPSK, DBPSK 802.11 g/n : OFDM /64-QAM,16-QAM, QPSK, BPSK
Output Power	802.11b /11Mbps : 15dBm , typical @ EVM -9dB 802.11g /54Mbps : 13dBm , typical@ EVM -25dB 802.11n /65Mbps : 12dBm , typical@ EVM -28dB
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -85dBm, typical - MCS=1 PER @ -84dBm, typica - MCS=2 PER @ -82dBm, typical - MCS=3 PER @ -80dBm, typical - MCS=4 PER @ -77Bm, typica - MCS=5 PER @ -73dBm, typical - MCS=6 PER @ -71dBm,typical - MCS=7 PER @ -69dBm, typical
Receive Sensitivity (11g) @10% PER	- 6Mbps PER @ -86Bm, typical - 9Mbps PER @ -85dBm, typical - 12Mbps PER @ -85dBm, typical - 18Mbps PER @ -83dBm, typica - 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 @ -88dBm, typical - 11Mbps PER @ -85dBm, 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	On board ANT :Small antennas with 0~2 dBi peak gain Option :One U.F.L connector for external antenna Option :ANT output pin

4.2. Power Consumption

Conditions:VDD=3V3 ; Temperature:25°C (TBD)

Mode	Description	Min	Typ	Max	Unit
802.11B	TX 11Mbps @ 15 dBm		300		mA
	RX 11Mbps @ -85dBm		TBD		mA
802.11G	TX 54Mbps @ 13dBm		230		mA
	RX54Mbps @ -72dBm		TBD		mA
802.11N	TX 65Mbps @ 12dBm		220		mA
	RX 65Mbps @ -69dBm		TBD		mA
Low power consumption					
Mode					
OFF(WL_REG_ON=Low)					
Sleep Mode					
IEEE PS @ DTIM = 100ms					
Beacon reception					

5. Pin Assignments

5.1. PinDescription

This is original define.More Alternate function mappingreference to table1

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	I/O	SPI_MOSI
5	SPI1_SSN	I/O	SPI_SSN
6	SPI1_SCK	I/O	SPI_SCK
7	SPI1_MISO	I/O	SPI_MISO
8	PA2	I/O	GPIO PIN
9	PA1	I/O	GPIO PIN
10	VBAT	I/O	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	PA3	I/O	GPIO PIN
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	I/O	I2C_SCL
18	I2C2_SDA	I/O	I2C_SDA
19	I2C2_SMBA	I/O	I2C_SMBA
20	GND	—	Ground
21	GND	—	Ground
22	JTAG_TDO	I/O	JTAG_TDO
23	JTAG_TDI	I/O	JTAG_TDI
24	JTAG_TRST_L	I/O	JTAG_TRST_L
25	JTAG_TCK	I/O	JTAG_TCK
26	JTAG_TMS	I/O	JTAG_TMS
27	USART1_RTS	I/O	HCI UARTrequest to send
28	NC	I/O	No function
29	USART1_RX	I/O	HCI UART receive input
30	USART1_TX	I/O	HCI UART transmit output
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	USART1_CTS	I/O	HCI UARTclear to send
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)

Alternate function Table 1

| 733 Pin number	JTAG	I2C2/I2C3	SPI1/I2S1/I2S3	I2S3/SPI4/I2S4/SPI5/I2S5	I2S3/USART1/USART2	USART6	USB
2							
4			SPI1_MOSI/I2S1_SD				
5&23	JTD1		SPI1_NSS/I2S1_WS	I2S3_WS	USART1_TX		
6&22	JTDO-SWO	I2C2_SDA	SPI1_SCK/I2S1_CK	I2S3_CK	USART1_RX		
7&24	JTRST	I2C3_SDA	SPI1_MISO		I2S3ext_SD		
8			I2S2_CKIN		USART2_TX		
9			SPI4_MOSI/I2S4_SD		USART2_RTS		
10							
12			I2S2_MCK		USART2_RX		
16							
17		I2C2_SCL	I2S2_CK	I2S3_MCK			
18		I2C2_SDA	I2S2_WS				
19		I2C2_SMBA	I2S2_WS	SPI4_NSS/I2S4_WS	I2S3_CK		
20							
21							
25	JTCK-SWCLK						
26	JTMS-SWDIO						
27		I2C3_SMBA		SPI5_MISO	USART1_RTS	USART6_RX	USB_FS_DP
29				SPI5_MOSI/I2S5_SD	USART1_RX		USB_FS_ID
30					USART1_TX		
31		I2C3_SDA		SPI5_MOSI/I2S5_SD			
33				SPI4_SDK/I2S4_CK			
34			I2S2_CK				
35		I2C3_SCL		SPI4_MISO	USART1_CTS	USART6_TX	USB_FS_DM
36				SPI5_NSS/I2S5_WS			
37				SPI5_SCK/I2S5_CK			
38			SPI1_NSS/I2S1_WS	I2S3_WS	USART2_CK		

6. Dimensions

6.1. Physical Dimensions

(TOP View) Unit:mm
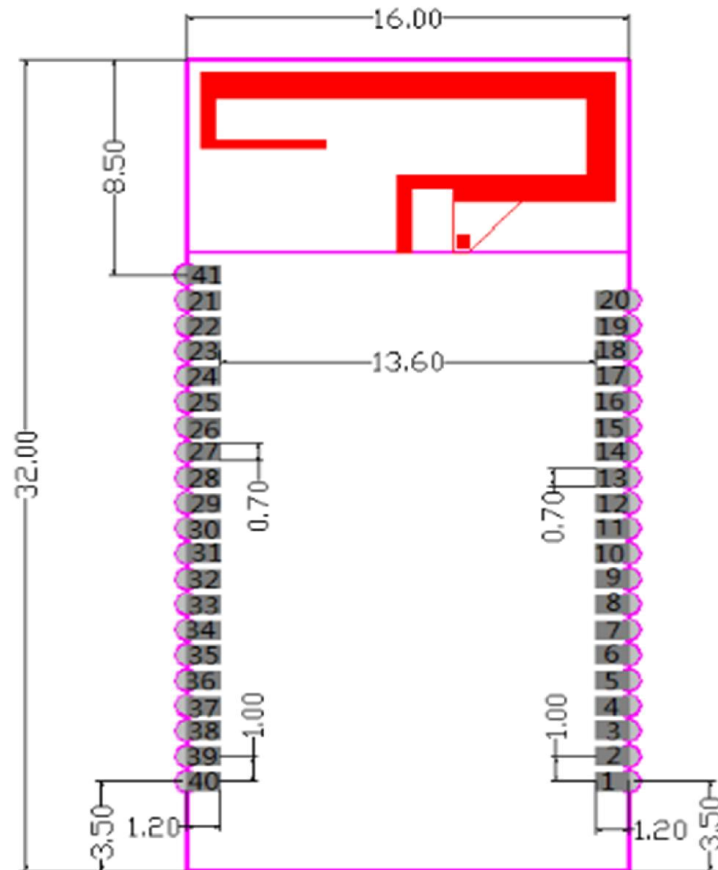
6.2. Layout Recommendation
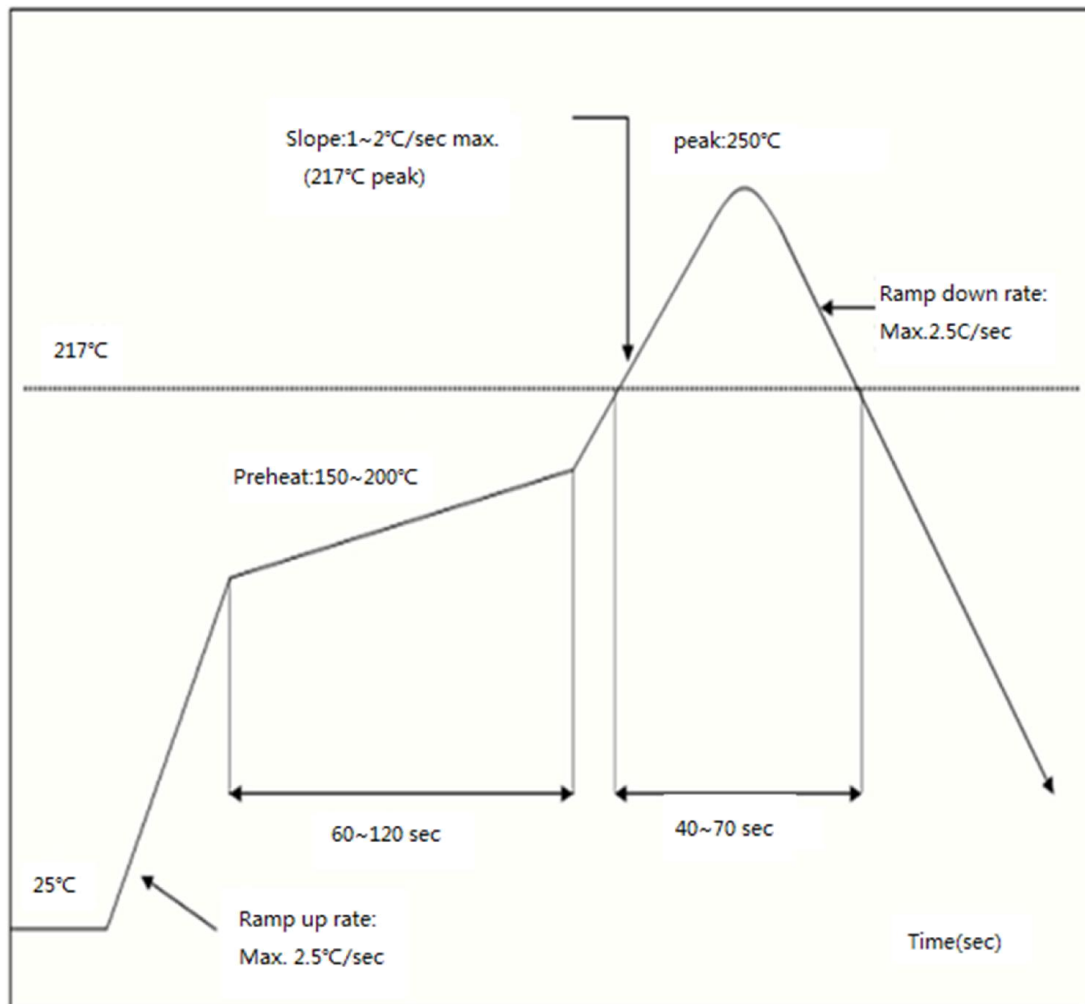
(TOP View) Unit:mm
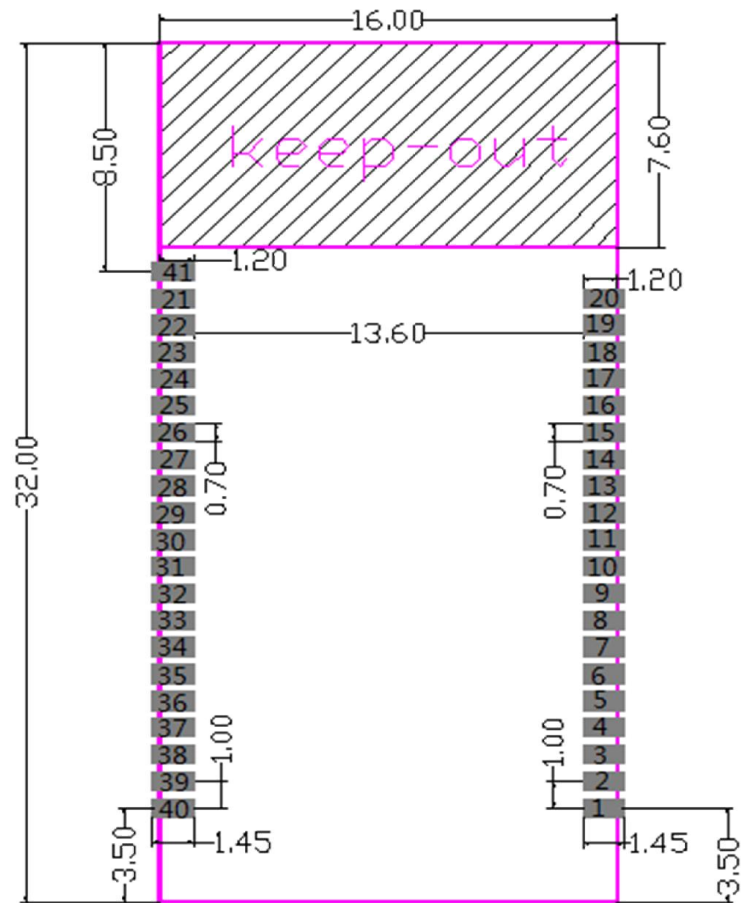
7. RECOMMENDED REFLOW PROFILE

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : 2 times

8.   SALES INFORMATION

If you need to buy this product, please call MXCHIP during the working hours. (Monday ~ Friday A.M.9:00~12:00; P.M. 1:00~6:00)

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Address: Room 811, Tongpu Building, No.1220 Tongpu Road, Shanghai

Post Code: 200333

Email: sales@mxchip.com

9. TECHNICAL SUPPORT

If you need to buy this product, please call MXCHIP during the working hours. (Monday ~ Friday A.M.9:00~12:00;P.M. 1:00~6:00)

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