

User manual

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Functional Description

Overview

TCM-F401-W4 is an ultra-low power WiFi module. It has a very competitive package size and ultra-low energy consumption technology. It is designed for mobile devices and Internet of Things applications. It can connect users' physical devices to Wi-Fi wireless networks, communicate with the Internet or LAN, and realize networking functions. TCM-F401-W4 is packaged with low cost PCB antenna, which brings very low cost to customers' products.。

Product Features

- Integrates a Tensilica L106 32-bit RISC processor, maximum clock speed of 160 MHz.
- 32Mbit SPI NORD FLASH, 250K RAM
- Support 802.11 b/g/n
- Support STA、AP、STA+AP
- Installed TCP/IP
- Support Enrich Socket AT
- Support UART、SPI、IIC、SDIO、GPIO
- Support ESP Touch、AI Link、Airkiss
- Support OTA
- Low power
- 3.3V Single Power

Subject of Application

- Smart Plug
- Home Automation
- Mest Net
- Smart light
- Baby monitor
- Sensor network
- Wireless Location Sensing Device
- Security ID tag
- Wireless Positioning System Signal

Electrical Characteristics

Basic electrical parameters

Char	MIN	MAX	UNIT
Vil	-0.3	0.25xVio	V
Vih	0.75xVio	3.3	V
Iil		50	nA
Vol		0.1 xVio	V
Voh	0.8xVio		V
Cpad		5	pF
Vio	1.8	3.3	V
I _{max}		12	mA
Tamb	-40	125	°C

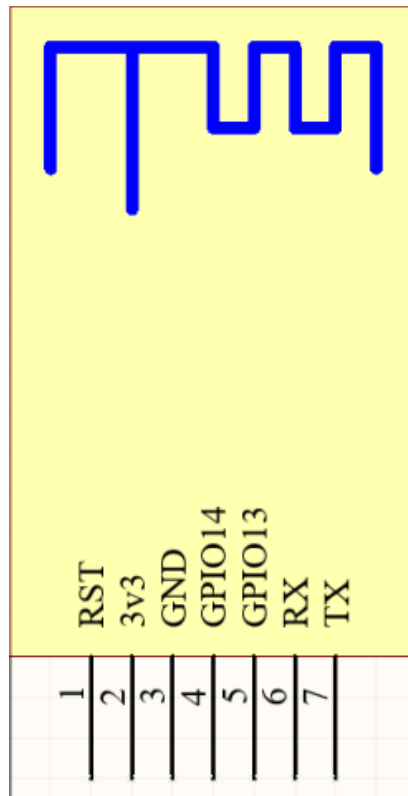
RF Parameter

describe	Min	Typ	Max	Unit
IN Frequency	2412	2437	2462	MHz
IN impedance		50		Ω
IN Reflect			-10	dB
PA Power @72.2Mbps	14	15	16	dBm
PA Power @802.11b	-17.81	-18.96	-18.77	dBm
sensitivity				
CCK 1Mbps		-98		dBm
CCK 11Mbps		-91		dBm
6Mbps(1/2BPSK)		-93		dBm
54Mbps(3/4 64-QAM)		-75		dBm
HT20, MCS7 (65Mbps, 72.2Mbps)		-71		dBm
Adjacent frequency suppression				
OFDM, 6Mbps		37		dB
OFDM, 54Mbps		21		dB
HT20, MCS0		37		dB
HT20, MCS7		20		dB

Power

Mode	Min	Typ	Max	Unit
Send 802.11b, CCK 5.5Mbps, Pout= -17.81dBm	-18.96	-18.77	-17.81	mW
Send 802.11g, OFDM18 Mbps, Pout= -19.75Bm	-22.74	-19.88	-19.55	mW
Send 802.11n, MCS4, Pout= -19.52dBm	-20.56	-20.08	-19.14	mW

Pin

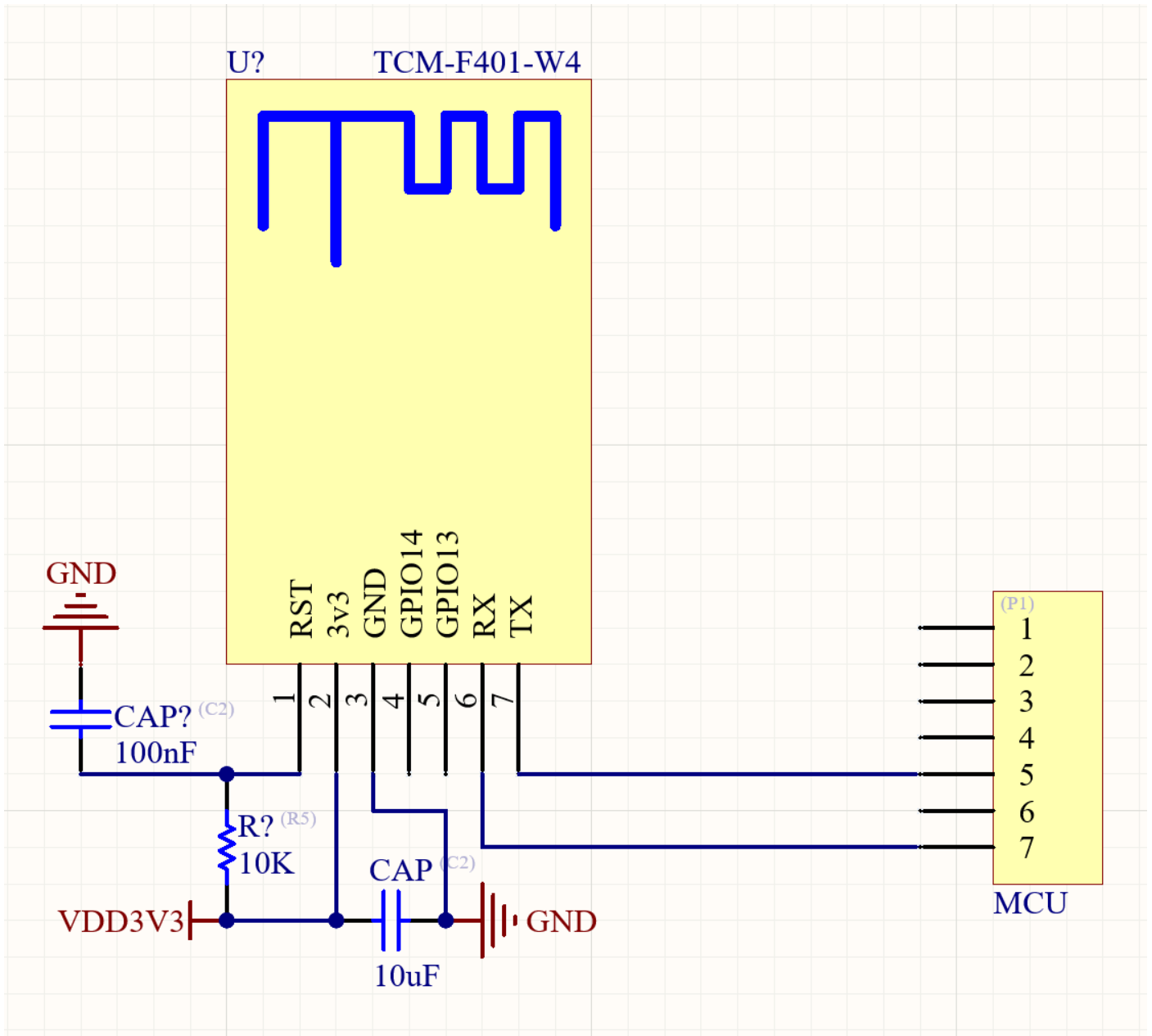


PIN	Function	Description
1	RST	1) Resets
5	IO14	1) GPIO
7	IO13	1) GPIO
8	VCC	1) VCC
15	GND	1) Ground
21	RXD0	1) UART-RX
22	TXD0	1) UART-TX

Boot

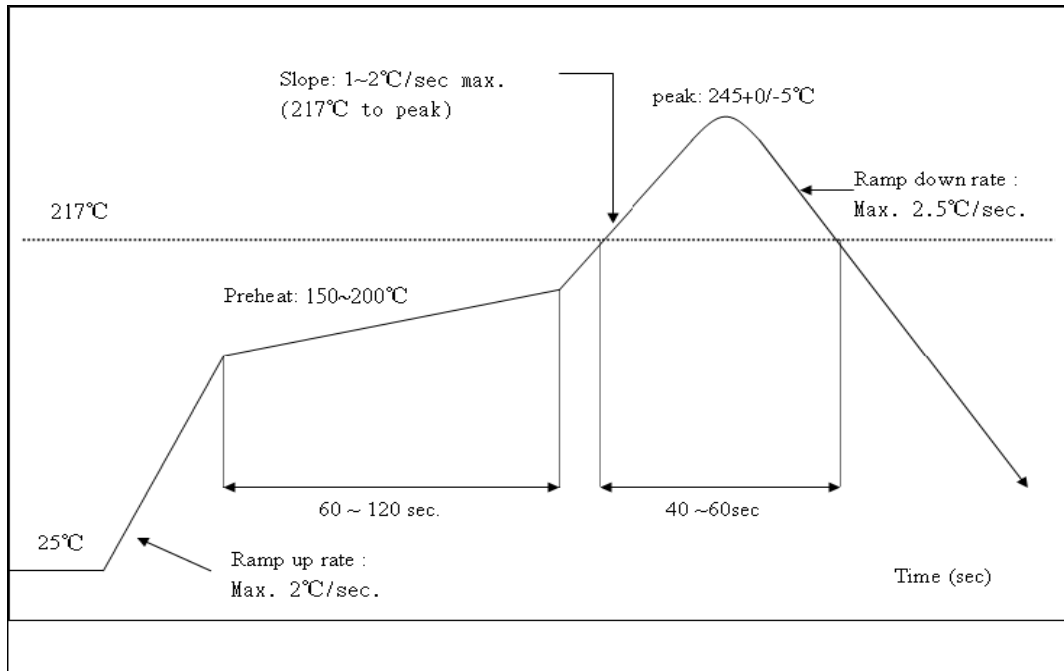
GPIO15	GPIO0	GPIO2	
1	X	X	SDIO/SPI WIFI
0	0	1	UART Download
0	1	1	Flash BOOT

Minimum system schematic diagram



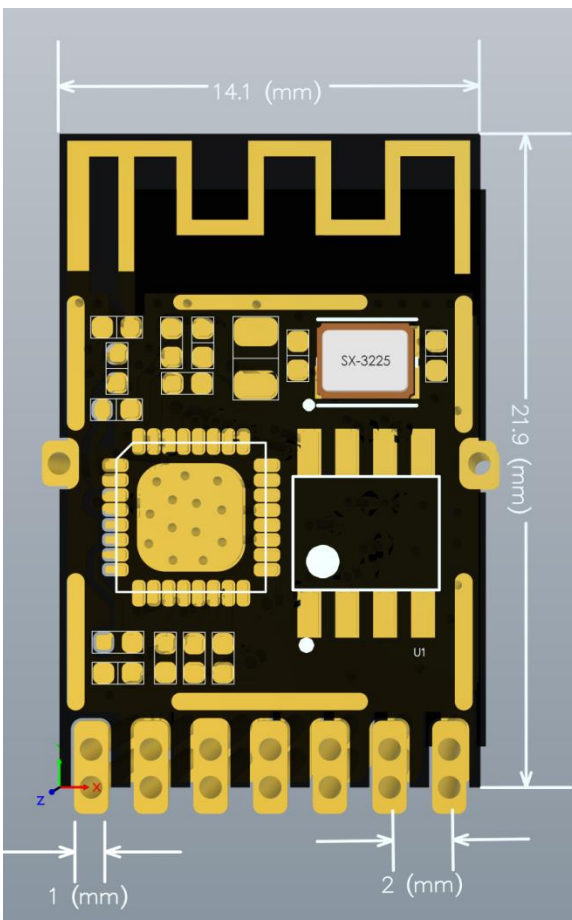
Welding Temperature Curve

Refer to IPC/JEDEC standard; Peak Temperature : <250°C; Number of Times: ≤2 times;



Dimensions

Size



FCC Statement

This device 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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.

Important Note:

Radiation Exposure Statement

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 and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Country Code selection feature to be disabled for products marketed to the US/Canada.

This device is intended only for OEM integrators under the following conditions:

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna,
3. For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change. (if modular only test Channel 1-11)

As long as the three conditions above are met, further transmitter testing will not be required. However, the OEM integrator or is still responsible for testing their end-product for any additional compliance requirements required with this module in stalled.

Important Note:

In the event that these conditions cannot 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 cannot 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.

End Product Labeling

The final end product must be labeled in a visible area with the following " Contains FCC ID: 2A3VE-TCM-F401-W4S " .

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.

The end user manual shall include all required regulatory information/warning as show in this manual.

Antenna information

The Wireless Communication Modules has been designed to pass certification with the antenna listed below.

The required antenna impedance is 50 ohms.

ISED Statement

- English: 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.

The digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3(B).

- French: Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This radio transmitter (ISED certification number: **28014-TCMF401W4S**) has been approved by Industry Canada to operate with the antenna types listed with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (ISED certification number: **28014-TCMF401W4S**) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Radiation Exposure Statement

This equipment complies with Canada 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.

Déclaration d'exposition aux radiations

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

This device is intended only for OEM integrators under the following condition:

The transmitter module may not be co-located with any other transmitter or antenna.

As long as the condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes:

Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 1 condition ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires.

Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC cannot 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 Canada authorization.

Note Importante:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l' IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

The final end product must be labeled in a visible area with the following: Contains IC: **28014-TCMF401W4S**.

Plaque signalétique du produit final

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: Contient des IC: **28014-TCMF401W4S**

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.

The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.