



晶訊科技股份有限公司
CC&C Technologies, Inc.

8F, No. 150, Jian Yi Road, Zhonghe District,
New Taipei City, Taiwan 235, R.O.C.
Tel: 886-2-8226-5088 Fax: 886-2-8226-5077

Product Specifications

CM-8822CU-V2 ac2x2+BT5.0 USB2.0

Version: 1.0

Manufacturer	CC&C Technologies, Inc.
--------------	-------------------------

Revision History

Version	Date	Change Description
1.0	09/23, 2019	Initial release
1.1	10/02,2019	Add power consumption mA

Overview

CM-8822CU-V2 is a WLAN 11ac and Bluetooth combo Module, provides a single USB interface to host, which fully supports the features and functional compliance of IEEE 802.11b/g/n/a/ac standards. Bluetooth v2.1 and v5.0 standards. It supports up to 866.7Mbps high-speed WLAN network connections and Bluetooth protocol stack.

It is designed to provide excellent performance with low power consumption and enhance the advantages of robust system and cost-effective.

CM-8822CU-V2 provides a complete solution for a high throughput performance integrated wireless LAN and Bluetooth module, and is targeted at competitive superior performance, better power management applications.

Features

- 802.11ac MIMO solution for 5G band
- Support 802.11ac 2T2R, wave-2 compliant with MU-MIMO
- Complies with USB Specification Revision 2.0
- Operate at ISM frequency bands (2.4GHz and 5GHz)
- IEEE standards support: IEEE 802.11b/ g/ n/ a/ ac/
- 2x2 MIMO technology for extended reception robustness and exceptional throughput
- 20MHz / 40MHz / 80MHz bandwidth transmission
- OFDM with BPSK, QPSK, 16QAM, 64QAM and 256QAM modulation.
Convolutional Coding Rate: 1/2, 2/3, 3/4, and 5/6
- Maximum PHY data rate up to 173.3 Mbps using 20MHz bandwidth, 400Mbps using 40MHz bandwidth, and 866.7Mbps using 80MHz bandwidth
- Backward compatible with 802.11a/b/g devices while operating at 802.11n data rate
- Compatible with Bluetooth v2.1
- Support Bluetooth v5.0 system
- Support Low Power Mode(Sniff/Sniff Sub-rating)
- Enhanced BT/WIFI Coexistence Control to improve transmission quality in different profiles
- Dual Mode supports Simultaneous LE and BR/EDR
- Supports multiple Low Energy states
- RoHS compliance
- Low Halogen compliance
- Transmit Beamforming
- Build-in both 2.4GHz PA
- Build-in both 2.4GHz LNA

General Specification

Model Name	CM-8822CU-V2
Product Name	ac2x2+BT5.0 USB2.0
Standard	IEEE 802.11b/g/n/a/ac/ Bluetooth v2.1/v5.0
Data Transfer Rate	WLAN: 802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n:MCS0 to 15 for HT20MHz, MCS0 to 15 for HT40MHz 802.11ac:NSS2 MCS0 to 8 for VHT20MHz,NSS2 MCS0 to 9 for VHT40MHz, NSS2 MCS0 to 9 for VHT80MHz Bluetooth: Basic rate: 1Mbps Enhanced data rate: 2, 3 Mbps Low Energy: LE_1Mbps,LE_125kbps,LE_500kbps,LE_2Mbps
Modulation Method	WLAN: CCK, DQPSK, DBPSK, BPSK, QPSK,16QAM, 64QAM, 256QAM Bluetooth: 8DPSK, $\pi/4$ DQPSK, GFSK
Frequency Band	2.4GHz and 5GHz ISM Band
Spread Spectrum	IEEE 802.11b: CCK (Complementary Code Keying) IEEE 802.11g/n/a/ac:OFDM (Orthogonal Frequency Division Multiplexing) Bluetooth: FHSS (Frequency Hopping Spread Spectrum)
Receiver Sensitivity	WLAN: <-76dBm – 802.11b@11Mbps <-65dBm – 802.11g@54Mbps <-64dBm – 802.11n@MCS7_BW20 <-61dBm – 802.11n@MCS7_BW40 <-51dBm – 802.11ac@NSS1_MCS9_BW80 Bluetooth: <-85dBm,BER<0.01% –Basic rate @1Mbps <-80dBm,BER<0.1% –Enhanced data rate @2,3Mbps <-85dBm,BER<=-30.8% –Low Energy @1Mbps, 125kbps, 500kbps, 2Mbps,
Antenna	PCB Antenna x2
Power supply	USB / DC 3.3V
Operating Temperature	0 - 50° C ambient temperature
Storage Temperature	-10 - 70° C ambient temperature

Humidity	5 to 90 % maximum (non-condensing)
Size	25 x 12 x 2mm (L x W x H)

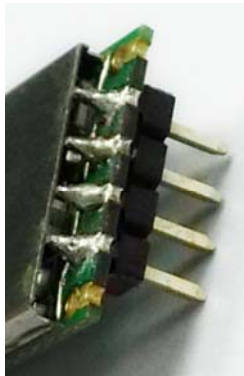
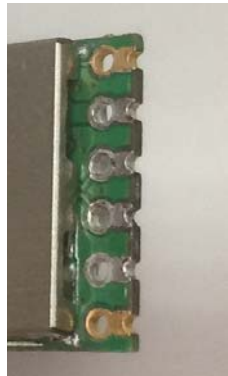
RF Output Power (Average) (tolerance ± 1 dBm)	WLAN 2.4G				
		Ant 0 (dBm)	Ant 1 (dBm)	MIMO (dBm)	EVM
	802.11b@CCK 11Mbps	19.5	19	N/A	< 8%
	802.11g@OFDM 54Mbps	18	18.5	N/A	< -25dB
	802.11n@MCS15_HT20	17	18.5	17	< -28dB
	802.11n@MCS15_HT40	17	18.5	14	< -28dB
	WLAN 5.2G				
		Ant 0 (dBm)	Ant 1 (dBm)	MIMO (dBm)	EVM
	OFDM 54Mbps	18	18	N/A	< -25dB
	MCS15_HT20	18	18	18	< -28dB
	MCS15_HT40	16	15	18	< -28dB
	NSS1 MCS8_BW20	15	15	15	< -32dB
	NSS1 MCS9_BW40	15	14.5	15	< -32dB
	NSS1 MCS9_BW80	15	14	15	< -32dB
	WLAN 5.8G				
		Ant 0 (dBm)	Ant 1 (dBm)	MIMO (dBm)	EVM
	OFDM 54Mbps	17.8	18.5	N/A	< -25dB
	MCS15_HT20	18	18	18	< -28dB
	MCS15_HT40	18	18	18	< -28dB
	NSS1 MCS8_BW20	14.5	15	15	< -32dB
	NSS1 MCS9_BW40	15	15	15	< -32dB
	NSS1 MCS9_BW80	15	15	15	< -32dB
	Bluetooth: 9 dBm				

DC power input Characteristics

Module	Minimum	Typical	Maximum	Unit
DC input voltage	3.135	3.3	3.465	V
DC power consumption	1.2	1.5	1.9	W
	360	450	580	mA

Factory options

- RF output by RF connector(type-1), Half Hole(type-2)
- With or without Pin Header(4 Pin or 6 Pin)

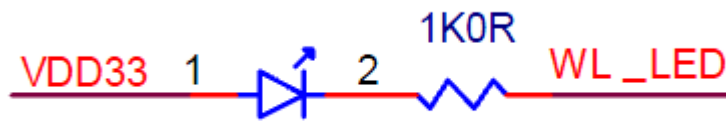
RF type-1	RF type-2	With Pin Header	Without Pin Header
			

Pin outs:



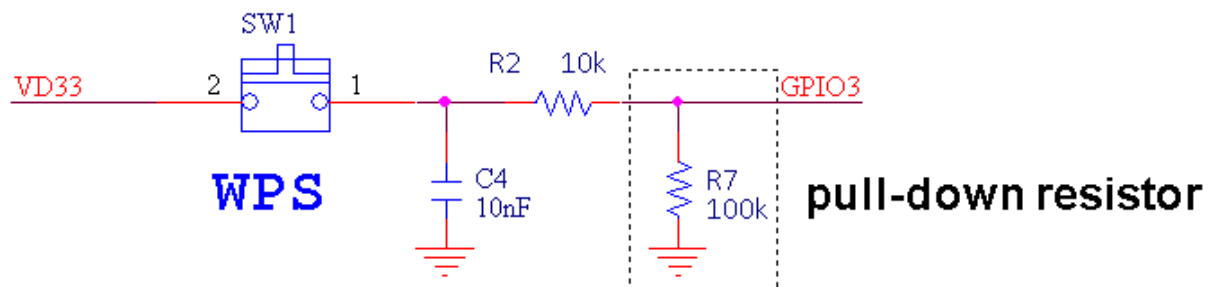
Pin	Signal	Input /Output	Description
1	WPS	Input	WPS Pin(Active High), shared with GPIO3 General Purpose Input/ Output Pin. When this function is not required, external pull-down resistor is required.
2	VDD	Power	DC 3.3V
3	HSDM	I/O	USB 2.0 Transceiver Differential Pair
4	HSDP	I/O	USB 2.0 Transceiver Differential Pair
5	GND	-	Ground
6	WL_LED	I/O	WL LED Pin(Active Low), shared with GPIO8 General Purpose Input/ Output Pin
7	GND	-	Ground
8	RF_S0	RF	WLAN RF port (if don't using IPEX connector)
9	GND	-	Ground
10	GND	-	Ground
11	RF_S1	RF	WLAN /BT RF port (if don't using IPEX connector)
12	GND	-	Ground

The external circuit for WiFi activity LED display

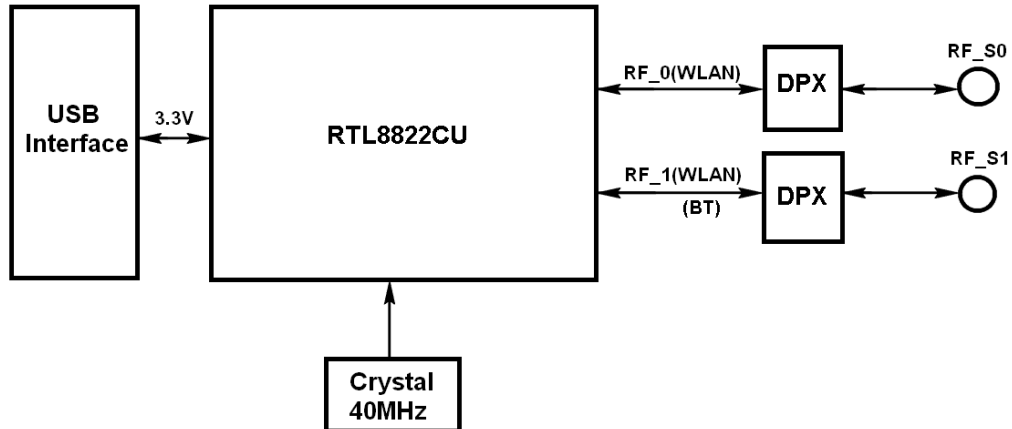


The external circuit for WiFi activity WPS display

(When this function is not required, external pull-down resistor is required.)

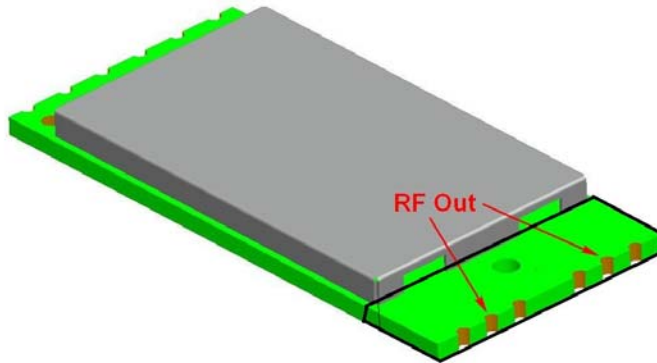


Block Diagram



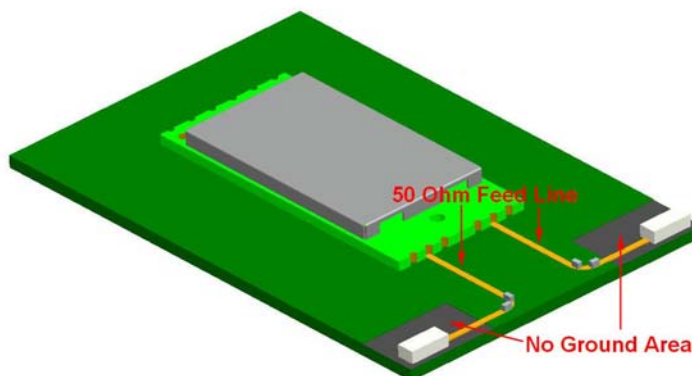
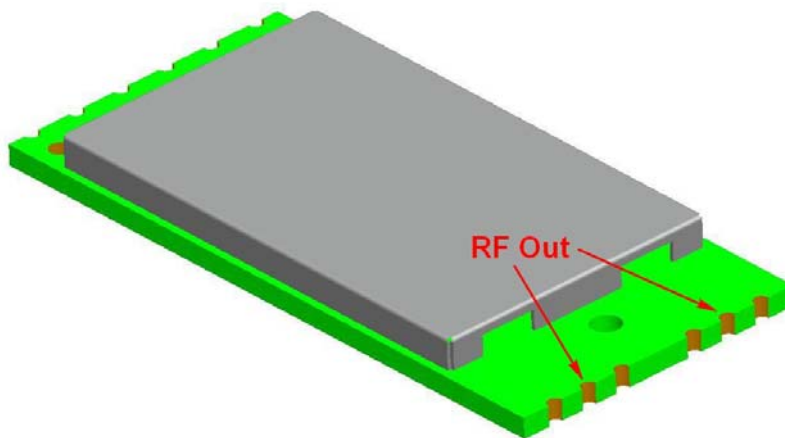
Placement Notice

- In order to get a better RF performance, please don't put any trace or copper plane under Black frame of the module.

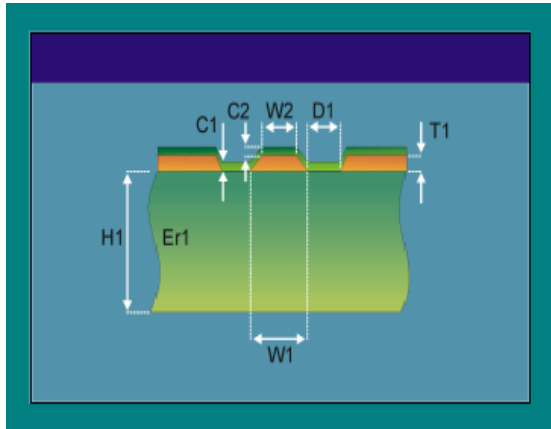


- **RF out**

Please have the impedance of feed lines to be 50 ohms from RF output pin to Antenna.



50 Ohm Feed line:



H1: 20 ~ 60 mil

Er1: 4.2

W1: 20 mil

W2: 20 mil

D1: 5 mil

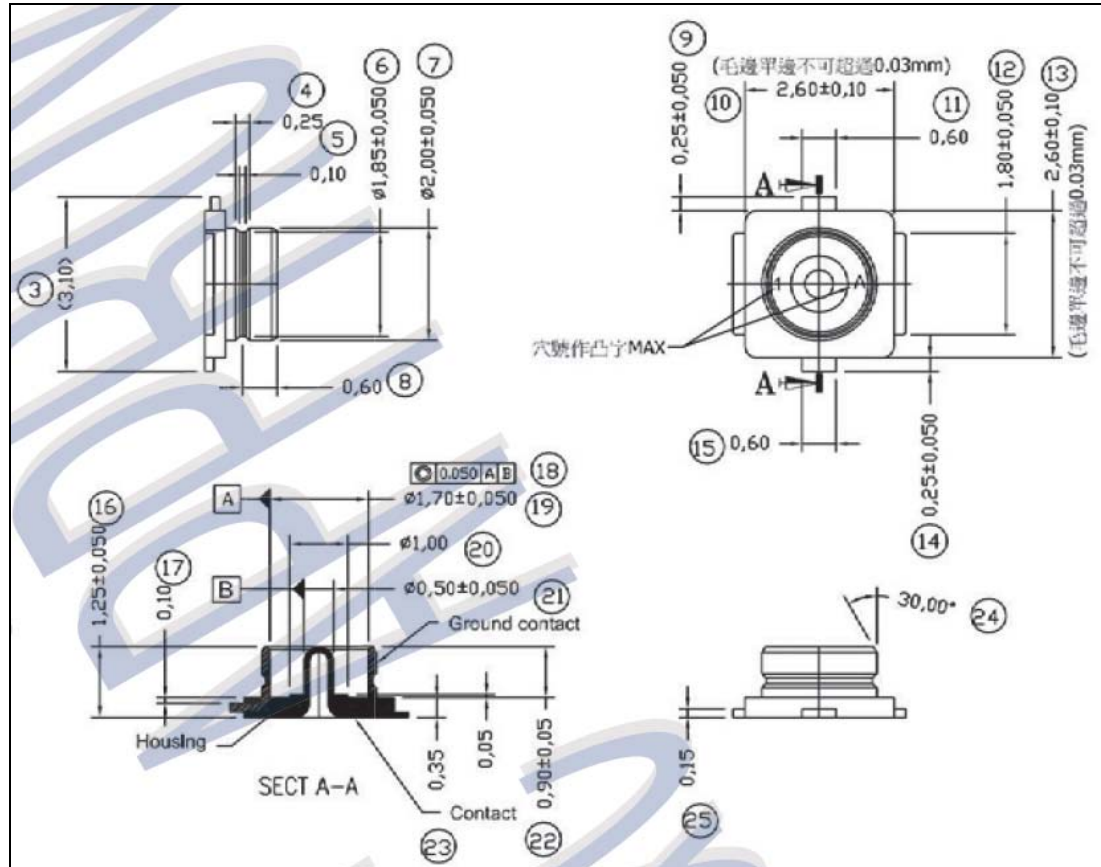
C1: 0.7 mil

C2: 0.7 mil

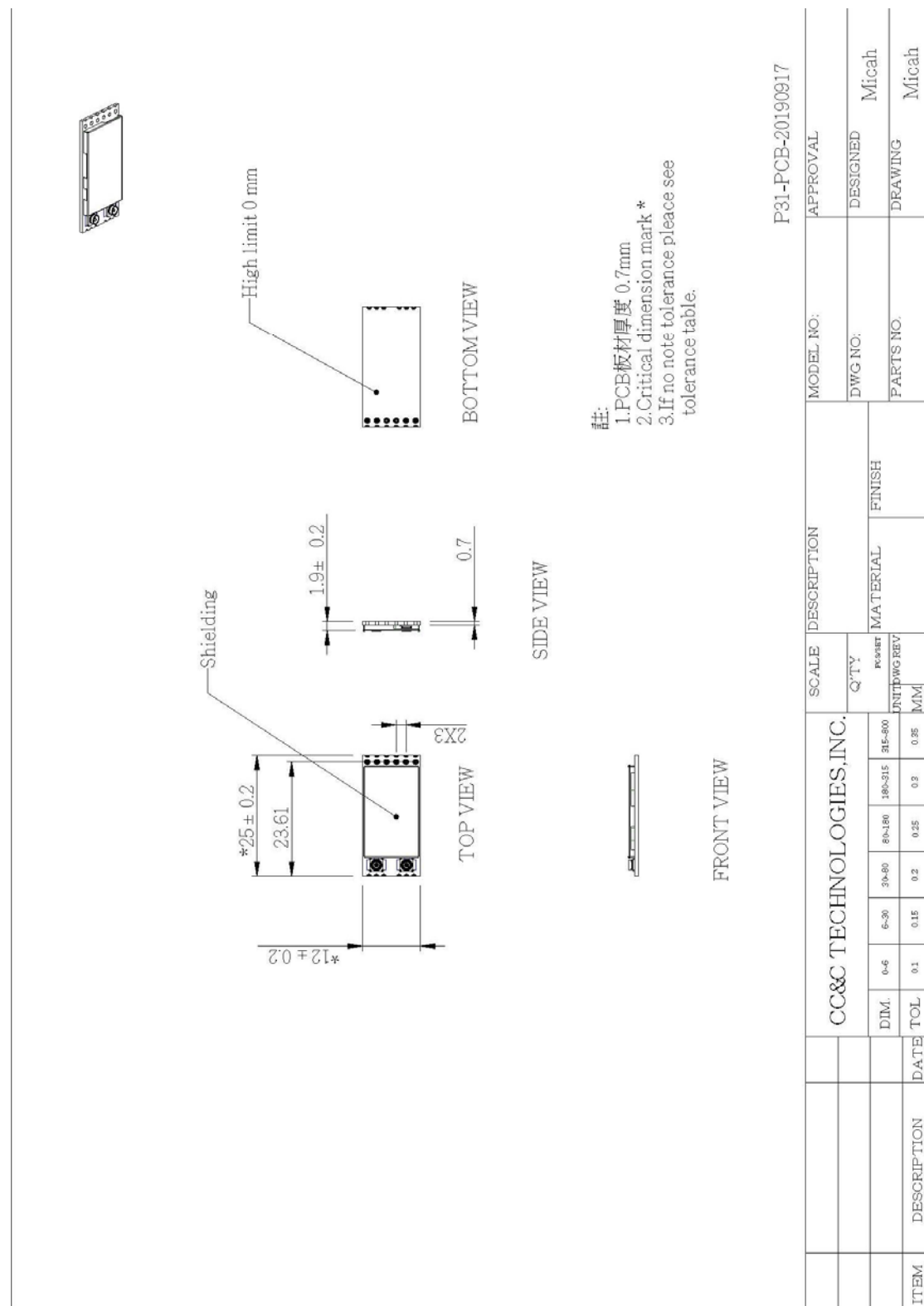
T1: 1.4 mil (1 oz)

Impedance: 51 ~ 53 Ohm

RF connector dimensions (unit: mm)

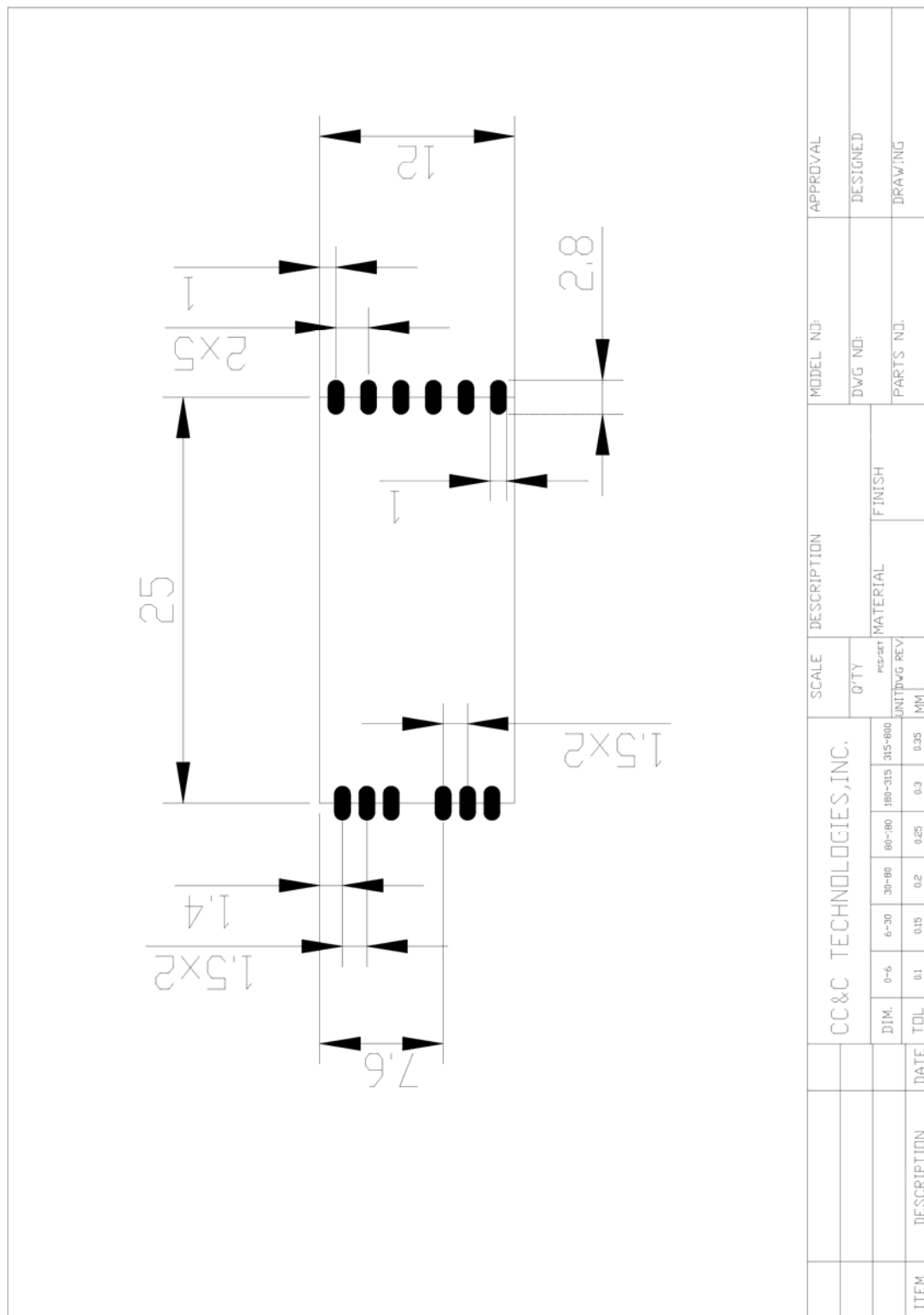


Dimension



PCB Layout footprint

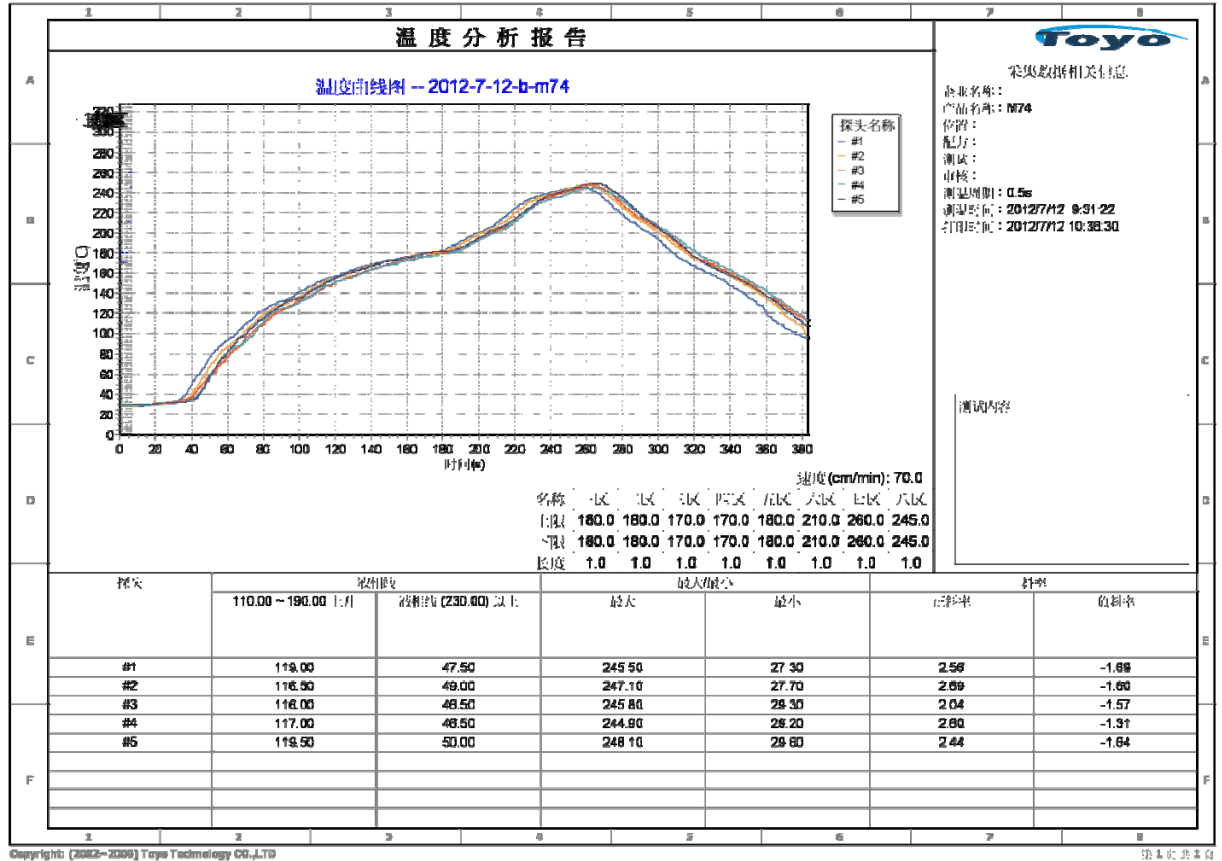
The recommended layout pads for CM-8822CU-V2 module are shown below. (Module top view)



All dimensions are in millimeters.

Tolerance: $\pm 0.2\text{mm}$

Reference Temperature Reflow Chart



Note:

1. If the system PCBA is double side design please reflow the side without this module first.
2. Don't let the solder machine temperature over 250°C or follow solder paste vender's recommended temperature.
3. The Ramp-up temperature speed is $1\sim 4^{\circ}\text{C}$ per second, the Ramp-down temperature speed is $1\sim 4^{\circ}\text{C}$ per second.
4. This temperature reflow chart is for reference only, it depends on the manufacturing machine's characters requirement.

This module is surface mount device; please refer below conditions for drying before solder reflow processes. (extracted from IPC/JEDEC J-STD-033B.1)

Bake @ 125°C		Bake @ 90°C		Bake @ 40°C	
Exceeding floor Life By > 72h	Exceeding floor Life By $\leq 72\text{h}$	Exceeding floor Life By > 72h	Exceeding floor Life By $\leq 72\text{h}$	Exceeding floor Life By > 72h	Exceeding floor Life By $\leq 72\text{h}$
9 hours	7 hours	33 hours	23 hours	13 days	9 days

Instructions to the OEM/Integrator:

This module has been granted modular approval for mobile applications. OEM integrators for host products may use the module in their final products without additional FCC/ISED (Innovation, Science and Economic Development Canada) certification if they meet the following conditions. Otherwise, Additional FCC/IC approvals must be obtained.

- The OEM must comply with the FCC labeling requirements. If the module's label is not visible when installed, then an additional permanent label must be applied on the outside of the finished product which states: "Contains transmitter module FCC ID: PANCM8822CUV2". Additionally, the following statement should be included on the label and in the final product's user manual:
"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 interferences, and (2) this device must accept any interference received, including interference that may cause undesired operation."
- The user's manual for the host product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC / IC RF exposure guidelines.
- The final host / module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.
- This Module is full modular approval, it is limited to OEM installation ONLY.
- The module is limited to installation in mobile application.
- A separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and difference antenna configurations.
- The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.
- The Grantee will provide guidance to the Host Manufacturer for compliance with the Part 15B requirements if requested.

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.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications 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
- This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment complies with FCC exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.