

RC-CC3200

based on TI CC3200



IoT Wi-Fi Module based on CC3200 Texas Instrument chip.

The RC-CC3200 module is the second-generation series of modules in the SimpleLink family and consists of an applications microcontroller unit (MCU), Wi-Fi network processor, and a power-management subsystem. The module comes integrated with all required components including on-board flash, clocks, and RF filter for easy hardware integration and quick time-to-market. The applications MCU subsystem contains an industry-standard ARM Cortex-M4 core running at 80MHz. The RC-CC3200 module supports a wide variety of rich peripherals, including fast parallel camera of embedded RAM memory options, with peripheral drivers in ROM memory. The series also includes a secure device with on-chip 128-bit secret key supporting secure boot as well as applications and user data encryption.

The RC-CC3200 module also features a Wi-Fi network processor subsystem which contains a dedicated ARM Cortex-M3 MCU to completely offload the applications MCU. This subsystem includes 802.11 b/g/n radio, baseband, and medium access control with a powerful crypto engine for fast secured WLAN and internet connections with 256-bit encryption. The RC-CC3200 module supports station, access point, and Wi-Fi Direct modes. The RC-CC3200 module also supports WPA2 personal and enterprise security and WPS 2.0. The Wi-Fi network processor includes an embedded IPv4 TCP/IP stack.

The power-management subsystem includes an integrated DC-DC converter with support for a wide range of supply voltages. This subsystem enables low-power consumption modes such as the hibernate with RTC mode which requires less than 18µA of current.

For more information you can make reference to the CC3200 TI datasheet.

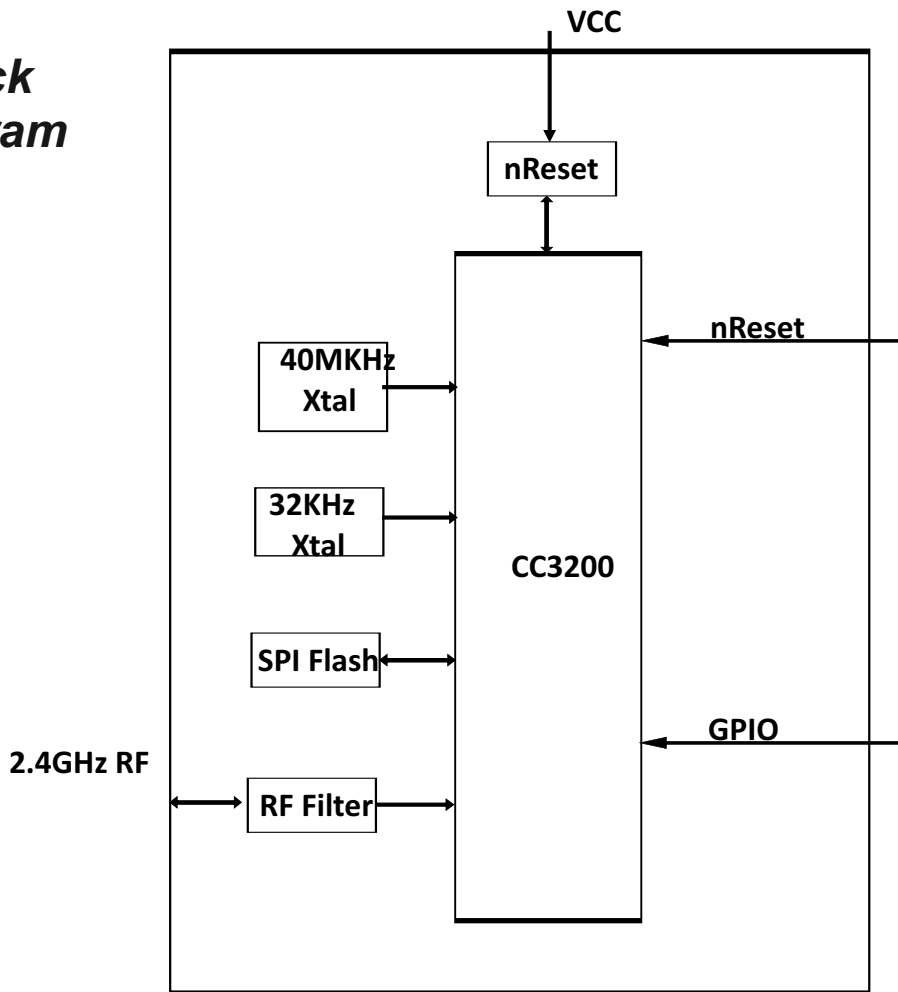
Feature

- Wi-Fi Microcontroller Module
- Based on ARM Cortex - M4 kernel running frequency of 80MHz
- Support Wi-Fi@2.4 GHz 802.11 b/g/n wireless standards
- Ultra low power mode, support deep dormancy
- Minisize: 18.22mm x 26.65mm x 1.5mm SMT
- FCC/CE Certificated, ROHS compliant

Applications

- Internet of Things (IoT)
- Home Automation
- Home Appliances
- Access Control
- Security Systems
- Smart Energy
- Industrial Control

1.0 Block Diagram



2.0 Technical Specifications

2.1 Absolute Maximum ratings

| Characteristics | MIN | TYP | MAX | UNIT |
|-------------------------------|------|-----|------------|------|
| VBAT and VIO (respect to GND) | -0,5 | 3.3 | 3.8 | VDC |
| Digital I/O (respect to GND) | -0,5 | | VBAT + 0.5 | VDC |
| Operating Temperature | -40 | 25 | +85 | °C |

2.2 Recommended Operating Conditions

| Characteristics | MIN | TYP | MAX | UNIT |
|-----------------|-----|-----|-----|------|
| VBAT and VIO | 2.3 | 3.3 | 3.6 | VDC |

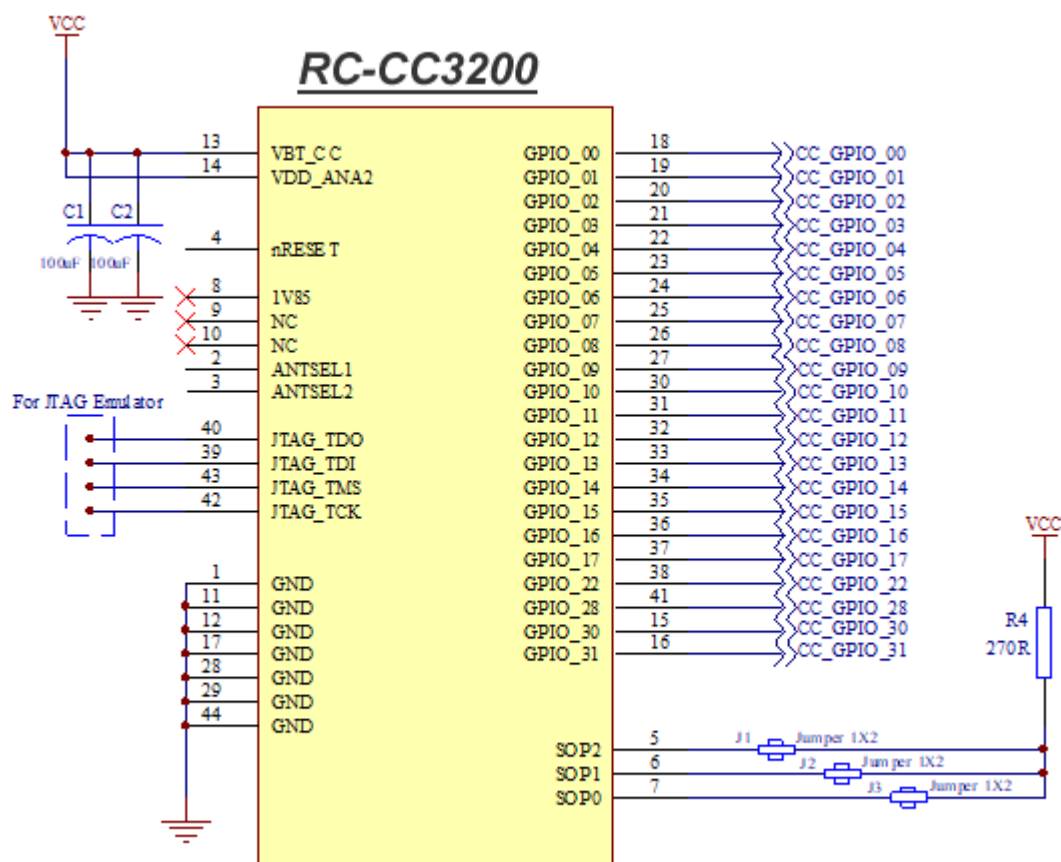
2.3 Reset requirement

| Characteristics | MIN | TYP | MAX | UNIT |
|--|-----|-------------|-----|------|
| Operation mode level (ViH) | | 0.65 x VBAT | | VDC |
| Shutdown mode level (ViL) | 0 | 0.6 | | VDC |
| Minimum time for nReset low for resetting module | 5 | | | mS |
| Rise/fall Time | | 25 | | µs |

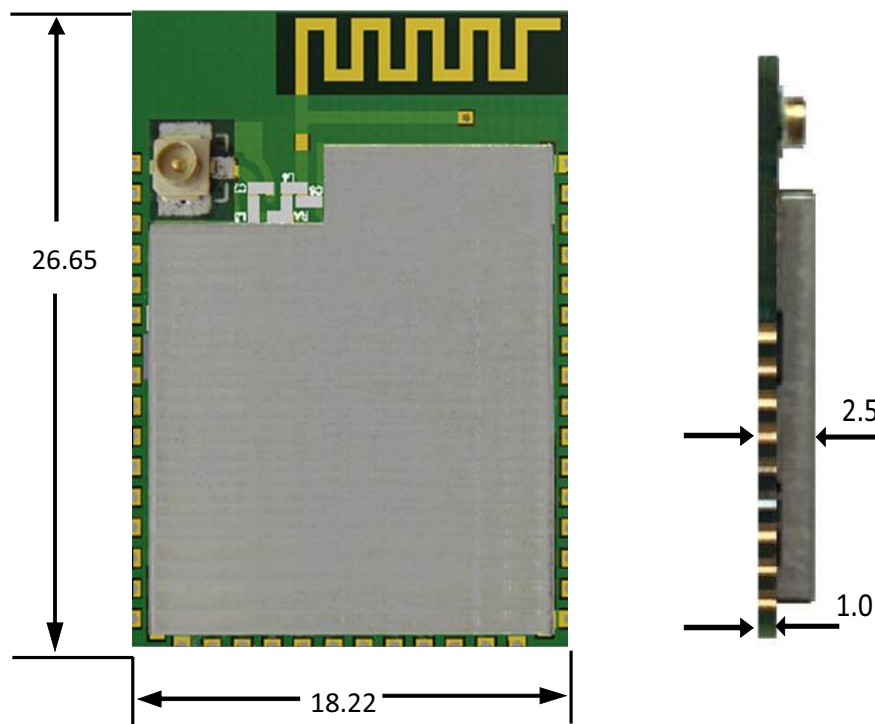
2.4 Current Consumption (Vbat=3.6Volt)

| Mode | Parameters | Condition | MIN | TYP | MAX | UNIT |
|------------|--------------------------|-----------|-----|-----|-----|------|
| MCU ACTIVE | TX Current | 1DSSS | | 278 | | mA |
| MCU ACTIVE | TX Current | 6OFDM | | 254 | | mA |
| MCU ACTIVE | TX Current | 54OFDM | | 229 | | mA |
| MCU ACTIVE | RX Current | 1DSSS | | 59 | | mA |
| MCU ACTIVE | RX Current | 54OFDM | | 59 | | mA |
| MCU SLEEP | TX Current | 1DSSS | | 275 | | mA |
| MCU SLEEP | TX Current | 6OFDM | | 251 | | mA |
| MCU SLEEP | TX Current | 54OFDM | | 226 | | mA |
| MCU SLEEP | RX Current | 1DSSS | | 56 | | mA |
| MCU SLEEP | RX Current | 54OFDM | | 56 | | mA |
| MCU LPDS | TX Current | 1DSSS | | 272 | | mA |
| MCU LPDS | TxCurent | 1DSSS | | 248 | | mA |
| MCU LPDS | TX Current | 6OFDM | | 223 | | mA |
| MCU LPDS | TX Current | 54OFDM | | 53 | | mA |
| MCU LPDS | RX Current | 1DSSS | | 53 | | mA |
| | Peak calibration current | VBAT=3.3V | | 450 | | mA |
| | Peak calibration current | VBAT=2.3V | | 520 | | mA |

REFERENCE SCHEMATICS

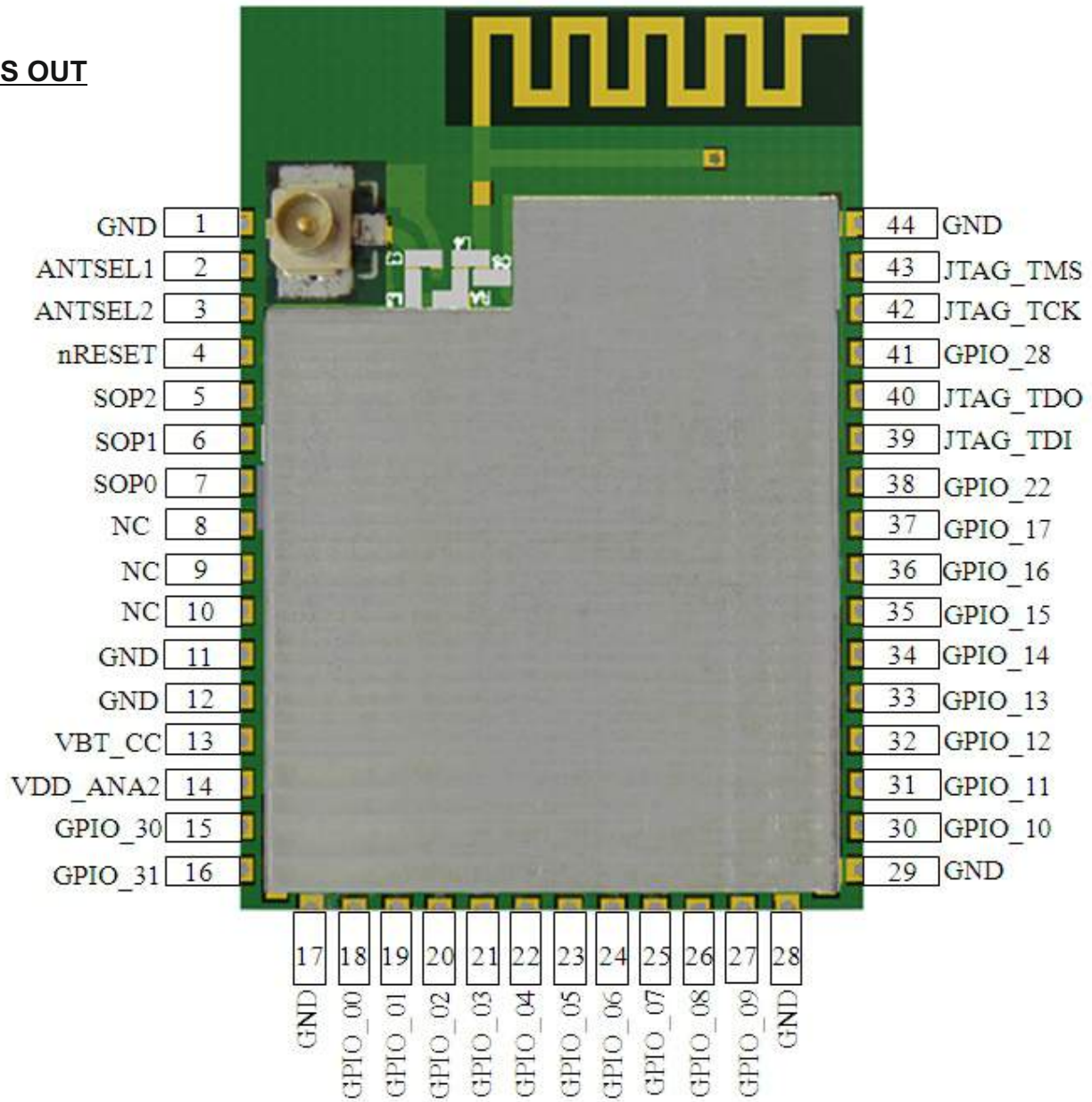


MECHANICAL DIMENSIONS



Unit: mm Tolerance: 0.2mm

PINS OUT



PINS OUT DESCRIPTION

| Pad Number | Pins Name | Description | CC3200 Pad Number |
|------------|-----------|--------------------------------|-------------------|
| 1 | GND | Ground | 65 |
| 2 | ANTSEL1 | Antenna Selection Control | 29 |
| 3 | ANTSEL2 | Antenna Selection Control | 30 |
| 4 | nRESET | Master chip reset (Active low) | 32 |
| 5 | SOP2 | Sense On Power 2 | 21 |
| 6 | SOP1 | Sense On Power 1 | 34 |

PINS OUT DESCRIPTION

| Pad Number | Pins Name | Description | CC3200 Pad Number |
|------------|-----------|-----------------------------------|-------------------|
| 7 | SOP0 | Sense On Power 0 | 35 |
| 8 | NC | | |
| 9 | NC | | |
| 10 | NC | | |
| 11 | GND | Ground | 65 |
| 12 | GND | Ground | 65 |
| 13 | VBT_CC | Chip Supply Voltage VBAT | 10,37,39,44,54 |
| 14 | VDD_ANA2 | ANA2 DCDC O | 47 |
| 15 | GPIO_30 | General-Purpose I/O | 53 |
| 16 | GPIO_31 | General-Purpose I/O | 45 |
| 17 | GND | Ground | 65 |
| 18 | GPIO_00 | General-Purpose I/O | 50 |
| 19 | GPIO_01 | General-Purpose I/O | 55 |
| 20 | GPIO_02 | General-Purpose I/O | 57 |
| 21 | GPIO_03 | General-Purpose I/O | 58 |
| 22 | GPIO_04 | General-Purpose I/O | 59 |
| 23 | GPIO_05 | General-Purpose I/O | 60 |
| 24 | GPIO_06 | General-Purpose I/O | 61 |
| 25 | GPIO_07 | General-Purpose I/O | 62 |
| 26 | GPIO_08 | General-Purpose I/O | 63 |
| 27 | GPIO_09 | General-Purpose I/O | 64 |
| 28 | GND | Ground | 65 |
| 29 | GND | Ground | 65 |
| 30 | GPIO_10 | General-Purpose I/O | 1 |
| 31 | GPIO_11 | General-Purpose I/O | 2 |
| 32 | GPIO_12 | General-Purpose I/O | 3 |
| 33 | GPIO_13 | General-Purpose I/O | 4 |
| 34 | GPIO_14 | General-Purpose I/O | 5 |
| 35 | GPIO_15 | General-Purpose I/O | 6 |
| 36 | GPIO_16 | General-Purpose I/O | 7 |
| 37 | GPIO_17 | General-Purpose I/O | 8 |
| 38 | GPIO_22 | General-Purpose I/O | 15 |
| 39 | JTAG_TDI | JTAG TDI - Reset Default Pinout | 16 |
| 40 | JTAG_TDO | JTAG TDO - Reset default Pinout | 17 |
| 41 | GPIO_28 | General-Purpose I/O | 18 |
| 42 | JTAG_TCK | JTAG/SWD TCK Reset Default Pinout | 19 |
| 43 | JTAG_TMS | JTAG/SWD TMS Reset default Pinout | 20 |
| 44 | GND | Ground | 65 |

3 Environmental Requirements and Specifications

3.1 Temperature

3.1.1 PCB Bending

The PCB bending specification shall maintain planeness at a thickness of less than 0.1mm

3.2 Handling Environment

3.2.1 ESD

The product ESD immunity is Human Body Model (HBM) $\geq \pm 1500(V)$, Mechanical Model(MM) $\geq \pm 200(V)$. Handle it under ESD protection environment.

This device is ESD sensitive, thus it must be protected at all times from ESD. Industry-standard ESD precautions must be followed at all time.

3.2.2 Terminals

The product is mounted with motherboard through stamp hole. To prevent poor soldering, do not touch it by hand.

3.2.3 Falling

The mounted components will be damaged if the product falls or is dropped. Such damage may cause the product malfunction.

3.3 Storage Condition

3.3.1 Moisture Barrier Bag Before Opened

A moisture barrier bag must be stored in a temperature of less than 30°C with humidity under 85% RH. The calculated shelf life for the dry-packed product shall be a 12 months from the date the bag is sealed.

3.3.2 Moisture Barrier Bag Open

Humidity indicator cards must be blue, <30%.

3.4 Baking Conditions

Products require baking before mounting if:

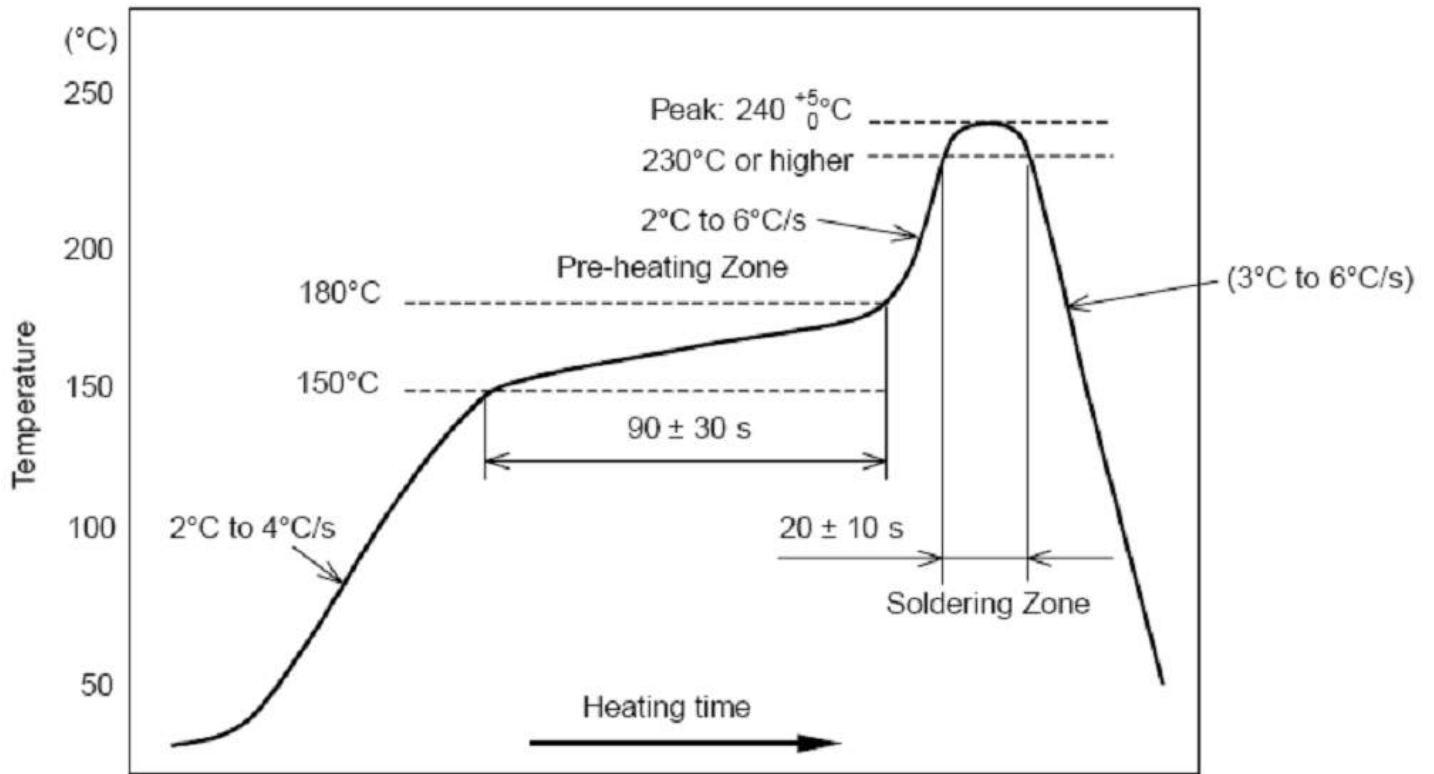
- Humidity indicator cards read >30%.
- Temp <30°C, humidity <70% RH, over 96 hours

Baking condition: 90°C, 12-24 hours

Baking times: 1 time

3.5 Soldering and Reflow Condition

1. Heating method: Conventional Convection or IR/convection
2. Temperature measurement: Thermocouple d=0.1mm to 0.2mm CA(K) or CC(T) at soldering portion or equivalent method.
3. Solder paste composition: Sn/3.0Ag/0.5Cu
4. Allowable reflow soldering times: 2 times based on the following reflow soldering profile (see Figure 6-1).
5. Temperature profile: Reflow soldering shall be done according to the following temperature profile (see Figure 6-1).
6. Peak temp: 245°C.



Temperature Profile for Evaluation of Solder Heat Resistance of a Component (at Solder Joint)

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