

LCS6260 IoT WLAN Module Datasheet

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1 General Description

The Wi-Fi Module is a small form-factor, single stream, 802.11b/g/n WiFi module with on-board low power application processor. It is a low cost serial WiFi module, support UART-WiFi - Ethernet data transmission.

The has been optimized for client applications in the home, enterprise, smart grid, home automation and control that have lower data rates and transmit or receive data on an infrequent basis. The Wi-Fi Module also enables rapid application development of ultra low power devices with the complete application SW on-chip . This combination makes the Wi-Fi Module an ideal solution for low power automation and sensor solutions because of its high efficiency and low power consumption.

The Wi-Fi Module can be used to design applications using 802.11b/g/n communication protocols. All features are enhanced by a built-in antenna, external antenna connector and an interface port to the carrier board. This interface port includes power supply pins, GPIO ports and UART ports.

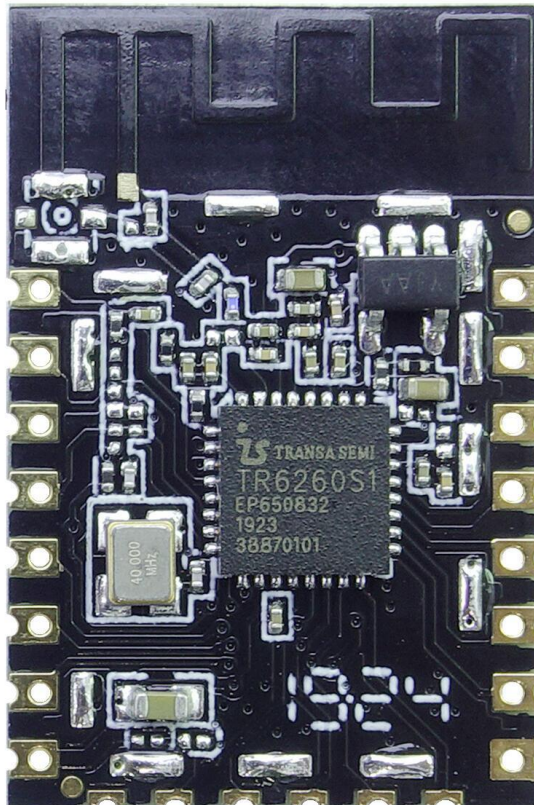


Figure 1: LCS6260 Top View

2 Applications

- ◆ IoT (internet of things)
- ◆ Network Consumer Device
- ◆ Metering
- ◆ Building Automation
- ◆ Home Automation
- ◆ Smart Home Gateway
- ◆ Smart Lighting
- ◆ Smart Plugs and Lights
- ◆ Baby Monitors
- ◆ Mesh Network
- ◆ Sensor Network
- ◆ Industry Control

3 Features

- ◆ 802.11 b/g/n/e/i
- ◆ 802.11 n (2.4 GHz), up to 150 Mbps
- ◆ 802.11 e: QoS for wireless multimedia technology
- ◆ Cloud Server, App
- ◆ A-MPDU and A-MSDU aggregation
- ◆ Network Protocols: IPv4, TCP/UDP/HTTP/FTP
- ◆ Fragmentation and defragmentation
- ◆ Automatic Beacon monitoring/scanning
- ◆ 802.11 i security features: pre-authentication and TSN
- ◆ Wi-Fi Protected Access (WPA)/WPA2/WPA2-Enterprise/Wi-Fi Protected Setup (WPS)
- ◆ Infrastructure BSS Station mode/Soft AP mode
- ◆ 2-channel Aux ADC with 14-bit ENOB
- ◆ Up to 6-channel HW PWM output
- ◆ Antenna diversity and selection
- ◆ RoHS compliance (Lead-free)

4 Application Block Diagram

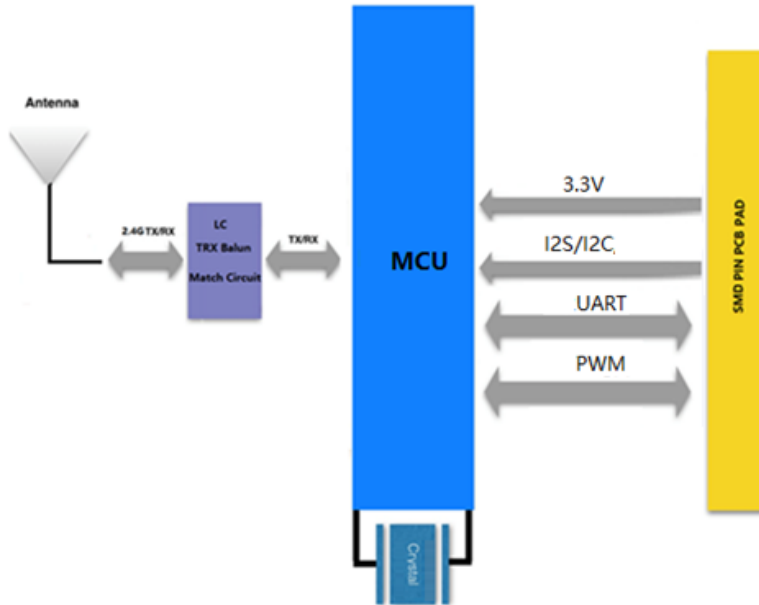


Figure 2: LCS6260 Block Diagram

5 Module Pinout and Pin Description

5.1 Module Pinout

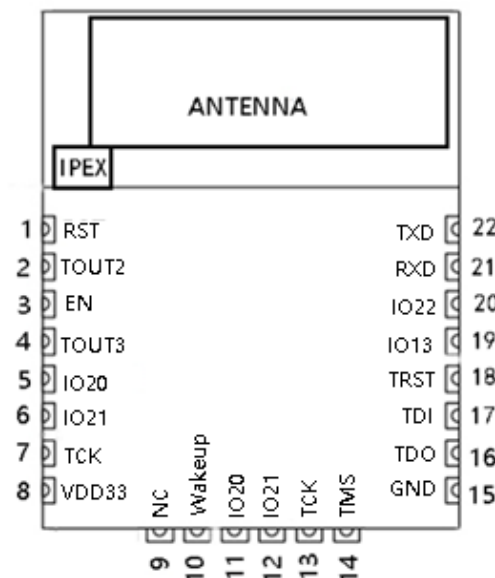


Figure 3: LCS6260 Pin Packag

5.2 Pin Description

| NO | Name | Function |
|----|--------|---------------------------------|
| 1 | RST | Reset Signal (Active Low) |
| 2 | TOUT2 | ADC2, PWM3, GPIO14, Boot mode 0 |
| 3 | EN | Chip enable pin. Active high. |
| 4 | TOUT3 | ADC3, PWM5, GPIO15, Boot mode 1 |
| 5 | IO20 | I2S_TXWS, GPIO20 |
| 6 | IO21 | I2S_TXSCK, GPIO21 |
| 7 | TCK | I2C_SCL, PWM0, GPIO0 |
| 8 | VDD33 | 3.3 V power supply (VDD) |
| 9 | NC | Not Connect |
| 10 | Wakeup | Wakeup, LINK LIGHT |
| 11 | IO20 | I2S_TXWS, GPIO20 |
| 12 | IO21 | I2S_TXWS, GPIO20 |
| 13 | TCK | I2C_SCL, PWM0, GPIO0 |
| 14 | TMS | I2C_SDA, PWM1, GPIO1 |
| 15 | GND | GND |
| 16 | TDO | UART1_RXD, PWM2, GPIO2 |
| 17 | TDI | UART1_TXD, PWM3, GPIO3 |
| 18 | TRST | I2S(mclk), PWM4, GPIO4 |
| 19 | IO13 | I2S_TXD, GPIO13 |
| 20 | IO22 | I2S_RXD, GPIO22 |
| 21 | RXD0 | UART0_RXD, GPIO5 |
| 22 | TXD0 | UART0_TXD, GPIO6 |

5.3 Download firmware

has three strapping pins:

- GPIO14, Boot mode 0: internal pull-up
- GPIO15, Boot mode 1: internal pull-down

| Boot mode 0 | Boot mode 1 | function |
|-------------|-------------|---------------|
| 1 | 0 | UART(default) |
| 1 | 1 | SPI Flash |

6 Interfaces

6.1 GPIO

The LCS6260 has 14 GPIO pins which can be assigned to various functions by programming the appropriate registers. These pins can be multiplexed with other functions such as I2C, I2S, UART, PWM, etc.

6.2 I2C

| LCS6260 Pin Number | Pin Name | GPIO | Function Name |
|--------------------|----------|-------|---------------|
| 7, 13 | TCK | GPIO0 | I2C_SCL |
| 14 | TMS | GPIO1 | I2C_SDA |

Table6-1: I2C pin share scheme

The I2C interfaces connect to one temperature sensor and also one external connector To control I2C, first should confirm that pinmux is used in right case, then connect sensor to the x1 connector.

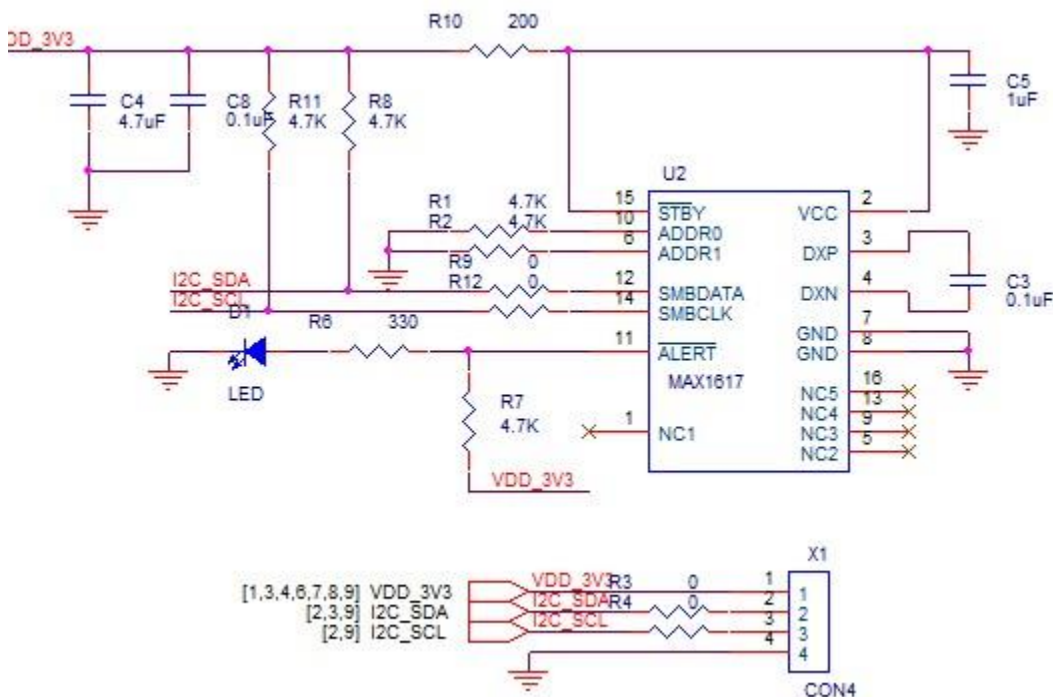


Figure 4: I2C interface

6.3 I2S

| LCS6260 Pin Number | Pin Name | GPIO | Function Name |
|--------------------|----------|------|---------------|
| 5, 11 | IO20 | IO20 | I2S_TXWS |
| 6, 12 | IO21 | IO21 | I2S_TXSCK |
| 18 | TRST | IO4 | I2S(mclk) |
| 19 | IO13 | IO13 | I2S_TXD |
| 20 | IO22 | IO22 | I2S_RXD |

Table6-2: I2S pin share scheme

6.4 UART

| LCS6260 Pin Number | Pin Name | GPIO | Function Name |
|--------------------|----------|-------|---------------|
| 21 | RXD0 | GPIO5 | UART0_RXD |
| 22 | TXD0 | GPIO6 | UART0_TXD |
| 16 | TDO | GPIO2 | UART1_RXD |
| 17 | TDI | GPIO3 | UART1_TXD |

Table6-3: UART pin share scheme

6.5 PWM

| LCS6260 Pin Number | Pin Name | GPIO | Function Name |
|--------------------|----------|--------|---------------|
| 2 | TOUT2 | GPIO14 | PWM3 |
| 4 | TOUT3 | GPIO15 | PWM5 |
| 7 | TCK | GPIO0 | PWM0 |
| 14 | TMS | GPIO1 | PWM1 |
| 16 | TDO | GPIO2 | PWM2 |
| 17 | TDI | GPIO3 | PWM3 |

Table6-4: PWM pin share scheme

6.6 ADC

| LCS6260 Pin Number | Pin Name | GPIO | Function Name |
|--------------------|----------|--------|---------------|
| 2 | TOUT2 | GPIO14 | ADC2 |
| 4 | TOUT3 | GPIO15 | ADC3 |

Table6-5: ADC pin share scheme

The AuxADC is for sampling the external analog parameter, such as temperature, voltage, and so on, the TR6260EVK has two external TOUT to sample the analog viable. To use AuxADC, should first set the right pinmux, and use the Tout to sample the analog parameter.

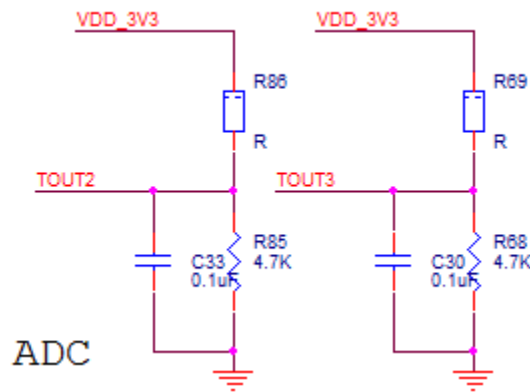


Figure 5: AuxADC interface

7 PCB Footprint and Dimensions

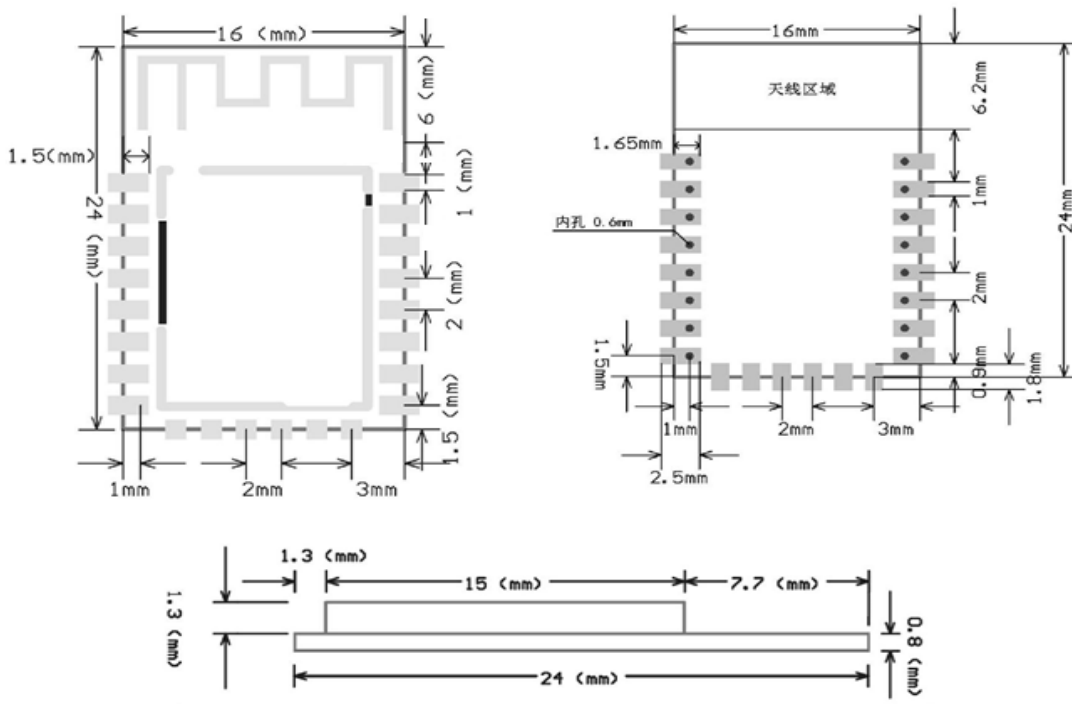


Figure 6: LCS6260 Recommend PCB Footprint

8 Electrical Characteristics

8.1 Absolute Maximum Ratings

| Parameter | Condition | Min. | Typ. | Max. | Unit |
|---------------------------|-----------|------|------|------|------|
| Storage Temperature Range | | -40 | | 125 | °C |
| ESD Protection | VESD | / | | 2000 | V |
| Supply Voltage | VDD33 | 0 | | 3.6 | V |
| Voltage On Any I/O Pin | | -0.3 | | 3.63 | V |

Table8-1: Absolute Maximum Ratings

Note: Absolute maximum ratings are stress ratings only, and functional operation at the maxims is not guaranteed. Stress beyond the limits specified in this table may affect device reliability or cause permanent damage to the device. For functional operating conditions, refer to the operating conditions tables as follow.

* series modules are Electrostatic Sensitive Devices and require special precautions while handling.



ESD precautions

The series modules contain highly sensitive electronic circuitry and are Electrostatic Sensitive Devices (ESD). Handling the series modules without proper ESD protection may destroy or damage them permanently.

The series modules are electrostatic sensitive devices (ESD) and require special ESD precautions typically applied to ESD sensitive components. Proper ESD handling and packaging procedures must be applied throughout the processing, handling, transportation and operation of any application that incorporates the series module. Don't touch the module by hand or solder with non-anti-static soldering iron to avoid damage to the mode.

8.2 Recommended Operation Ratings

| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|----------------------|--------|------|------|------|------|
| Extended temp. range | TA | -20 | | 70 | °C |
| Power Supply | VDD33 | 3.0 | 3.3 | 3.6 | V |
| Input Low Voltage | VIL | -0.3 | | 0.8 | V |
| Input High Voltage | VIH | 2 | | 3.6 | V |

Table8-2: Operating Conditions

8.3 Measurement Conditions

| System State | Description | Current (Typ.)@3.3V |
|-----------------------|-------------------------|---------------------|
| Deep-sleep | Only RTC Power on | 20uA |
| Light-sleep | Receive Beacon packages | 0.9mA |
| DTIM1 | The CPU is Power on | 1.5 mA |
| Active RX(RF Working) | RX and Listening | 45-50 mA |
| Active TX(RF Working) | WIFI TX 13-18dBm | 160-280 mA |

Table8-3:LCS6260 Power Consumption in Different States

9. Performance Specification

| Hardware Features | |
|----------------------|-------------------------------|
| Model | |
| ANTENNA TYPE | PCB Antenna or IPEX Connector |
| Voltage | 3.3V+/-10% |
| DIMENSIONS(L×W×H) | 24.0mm*16.0mm*2.4mm |
| 2.4GHz WiFi Features | |
| WIRELESS STANDARDS | IEEE 802.11 b/g/n/ |

| | |
|--|--|
| FREQUENCY RANGE | 2.412-2.484GHz |
| DATA RATES | IEEE 802.11a Standard Mode: 6,9,12,18,24,36,48,54Mbps |
| | IEEE 802.11 b Standard Mode: 1,2,5.5,11Mbps |
| | IEEE 802.11g Standard Mode: 6,9,12,18,24,36,48,54Mbps |
| | IEEE 802.11n Standard Mode: 150Mbps @ HT40(MCS7) |
| 2.4G RECEIVE SENSITIVITY | HT20 MCS7 : -70dBm@10% PER(MCS7) |
| | OFDM 54M: -73dBm@10% PER |
| | CCK, 11M: -88dBm@ 8% PER |
| WIRELESS SECURITY | Supports WEP64/128, WPA, WPA2, TKIP, WAPI, and AES hardware encryption |
| WIRELESS TRANSMIT POWER With ± 2 dBm tolerance | IEEE 802.11n: 12-14dBm@HT20 MCS7 |
| | IEEE 802.11g: 15dBm |
| | IEEE 802.11b: 18dBm |
| WORK MODE | Soft AP/ Station/Soft AP+Station |
| Others | |
| ENVIRONMENT | Operating Temperature: -40°C~85°C |
| | Storage Temperature: -40°C~125°C |
| | Operating Humidity: 10%~90% non-condensing |
| | Storage Humidity: 5%~90% non-condensing |

10 Manufacturing Process Recommendations

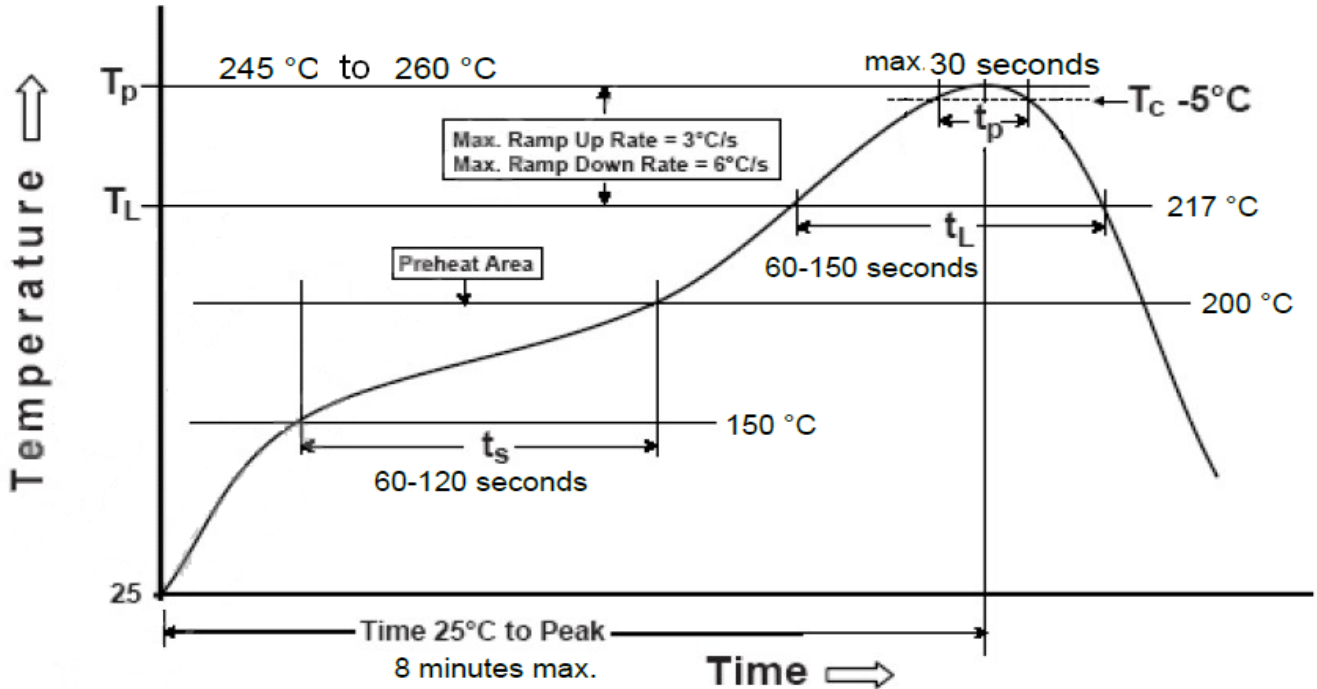


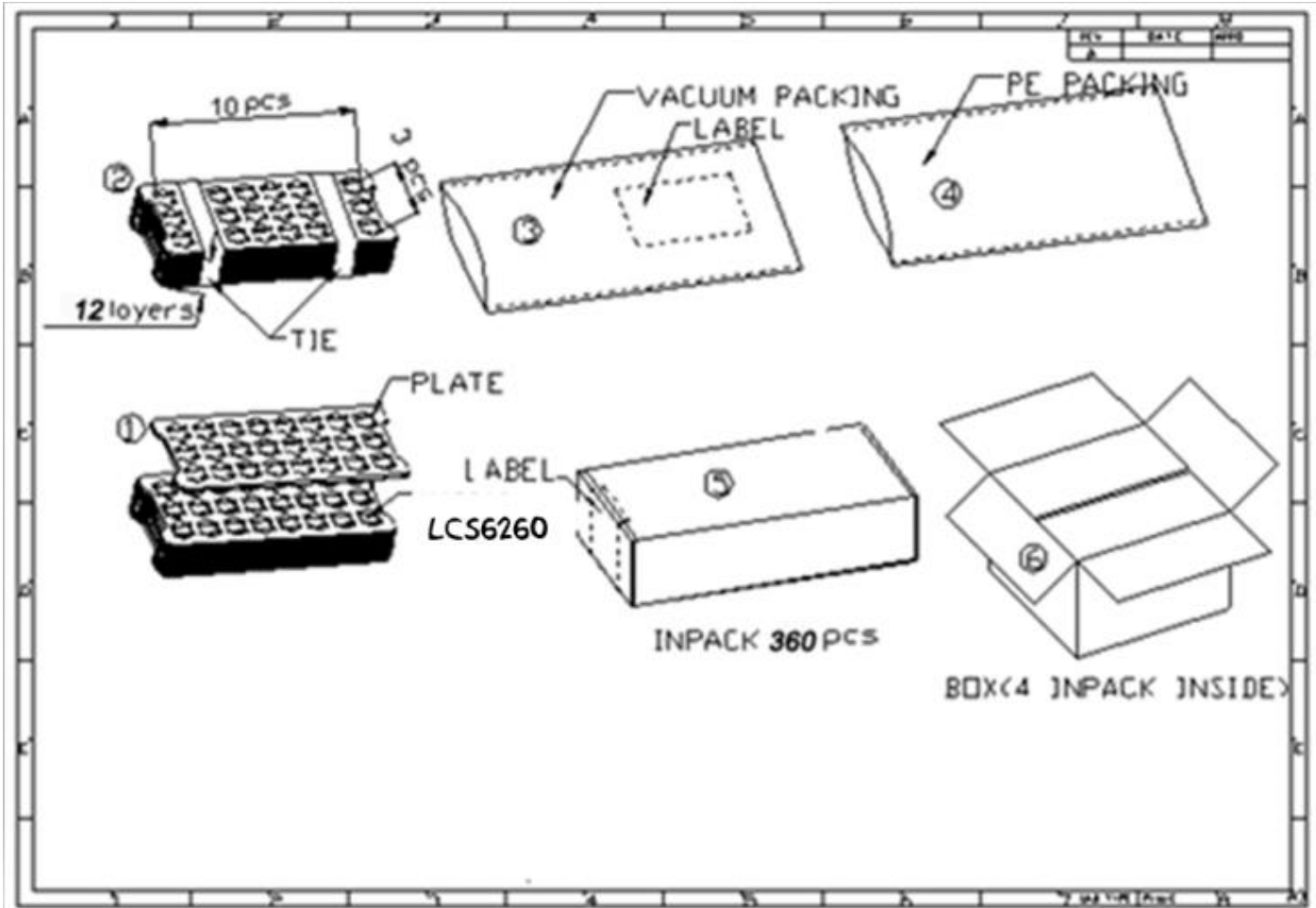
Figure 8: LCS6260 Typical Lead-free Soldering Profile

Note: The final soldering temperature chosen at the factory depends on additional external factors like choice of soldering paste, size, thickness and properties of the baseboard, etc. Exceeding the maximum soldering temperature in the recommended soldering profile may permanently damage the module.

11 Ordering Information

| Module No. | Antenna Connector Type |
|------------|------------------------|
| LCS6260-E | IPEX Connector |
| LCS6260-P | PCB Antenna |

12 Packaging Specification



13 Revision History

| Revision | Description | Approved | Date |
|----------|-----------------|-----------|-----------|
| V1.01 | Initial Release | George He | 2019.08.7 |

14 Contact Information

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