

# LCS6260 Datasheet

## IoT WLAN Module

### Document Information

<b>Title</b>	LCS6260 Datasheet IoT WLAN Module	
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<b>Document type</b>	Datasheet	
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<b>Document number</b>	LS-19080010	
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<b>Revision and date</b>	V1.05	22-Sep-2022
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<b>Disclosure restriction</b>	Public	
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## Revision History

Revision	Description	Approved	Date
V1.01	Initial Release	George He	2019.08.7
V1.02	Add Reference Circuit	Wendy	20211207
V1.03	Update the Data rates: delete IEEE 802.11a Standard Mode	Wendy	20220308
V1.04	Update PCB reference package diagram	Wendy	20220429
V1.05	Update product pictures	Wendy	20220922

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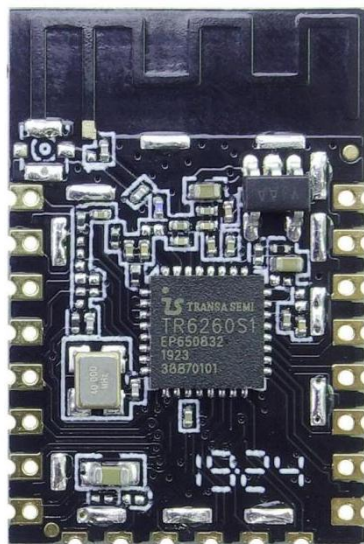
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## 1 General Description

The LCS6260 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. It 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 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.



(With half a hole)



(Without half a hole)

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 150Mbps
- ◆ 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

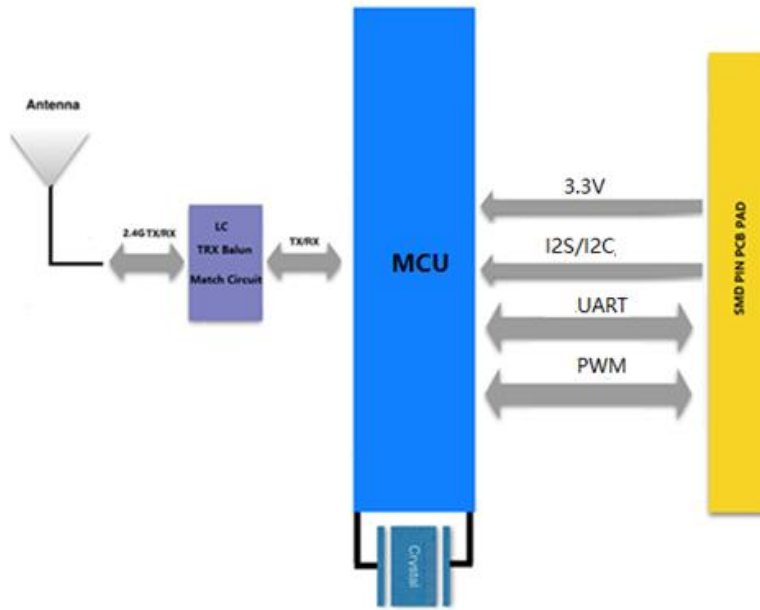


Figure 2: LCS6260 Block Diagram

## 5 Module Pinout and Pin Description

### 5.1 Module Pinout

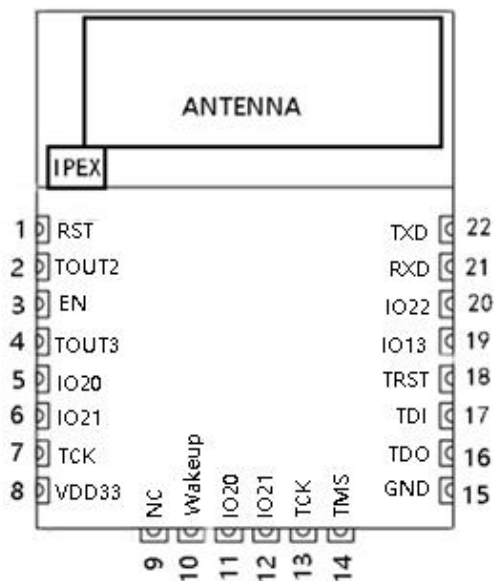


Figure 3: LCS6260 Pin Package

## 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	Wake up, 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

Table6-1: I2C pin share scheme

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

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.

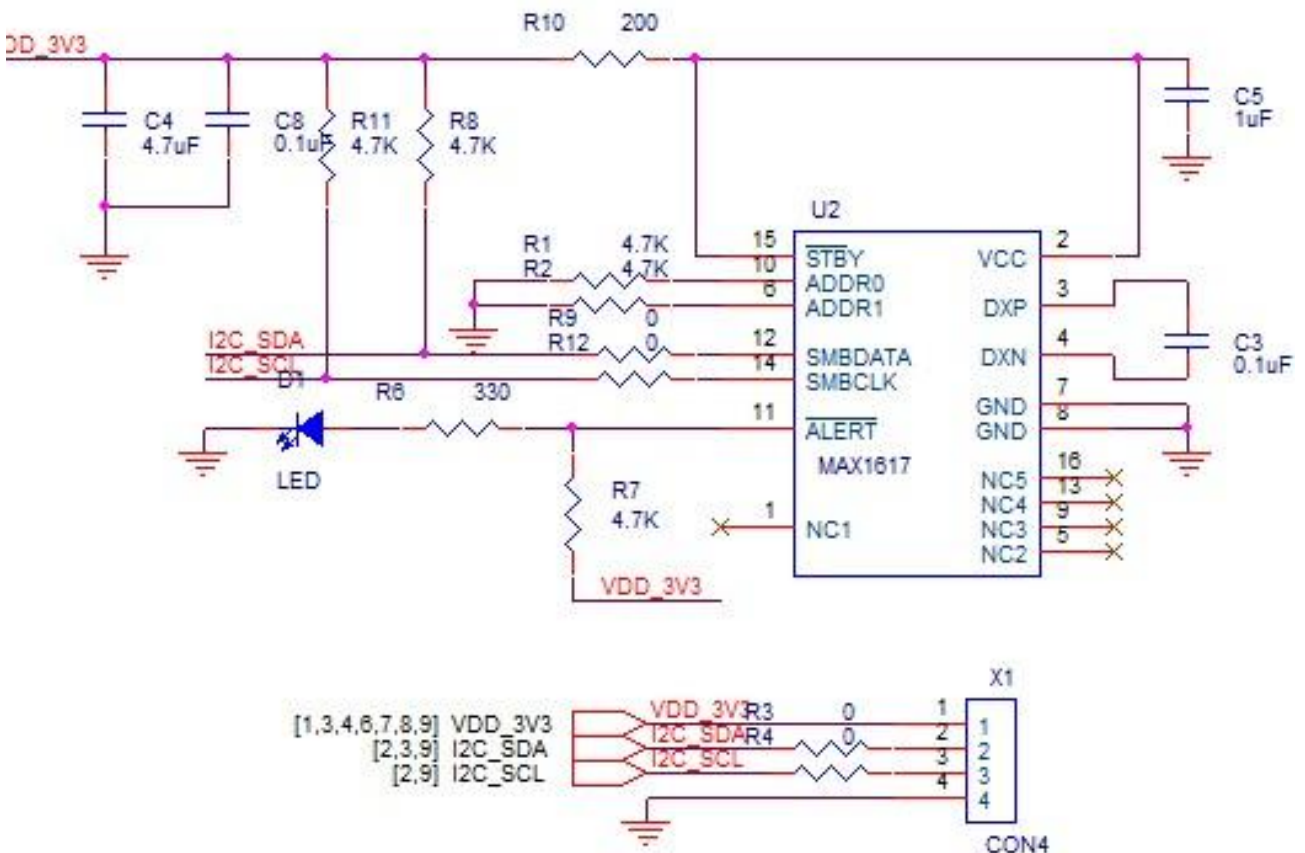


Figure 4: I2C interface



## 6.3 I2S

Table6-2: I2S pin share scheme

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

## 6.4 UART

Table6-3: UART pin share scheme

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

## 6.5 PWM

Table6-4: PWM pin share scheme

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

## 6.6 ADC

Table6-5: ADC pin share scheme

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

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.

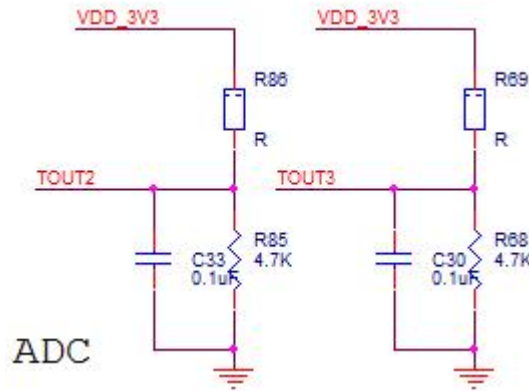
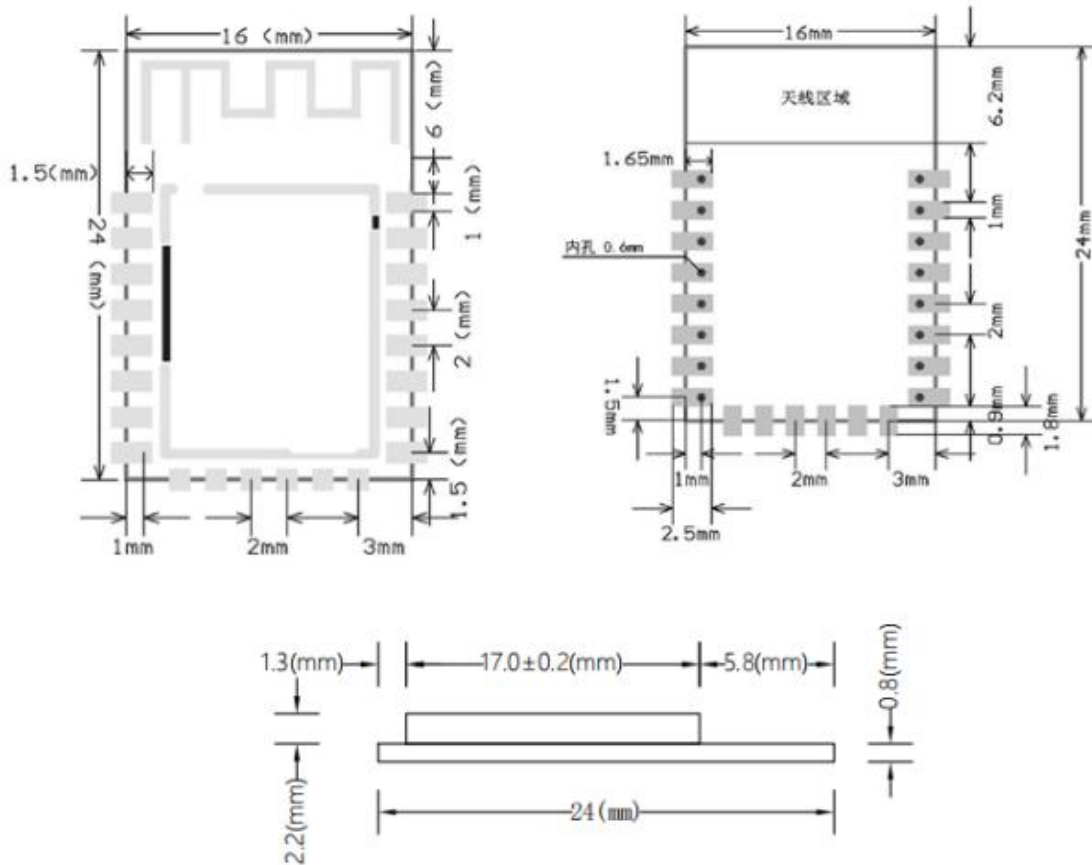


Figure 5: AuxADC interface

## 7 PCB Footprint and Dimensions



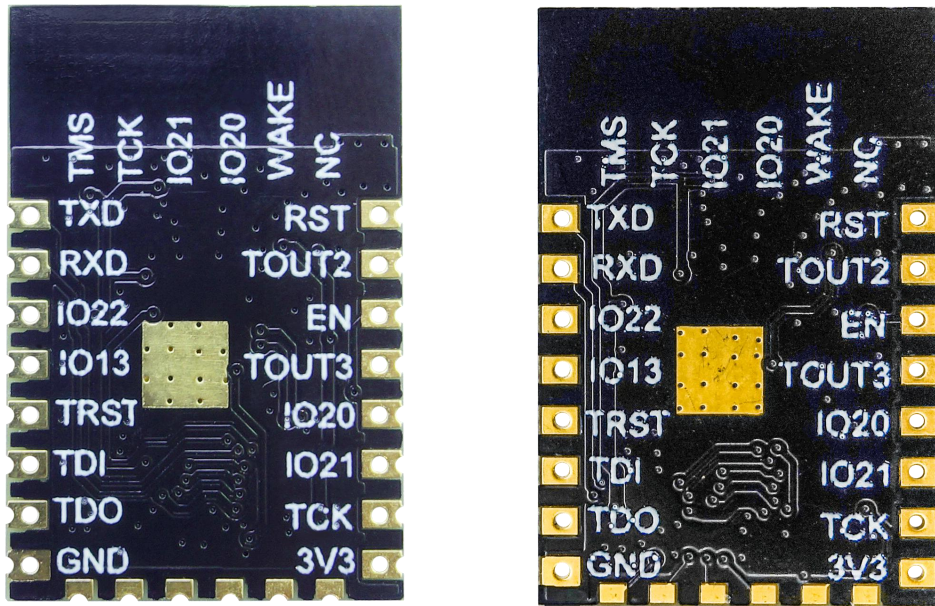


Figure 6: LCS6260 Recommend PCB Footprint

## 8 Electrical Characteristics

### 8.1 Absolute Maximum Ratings

Table8-1: Absolute Maximum Ratings

Parameter	Condition	Min.	Type	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

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

Table8-2: Operating Conditions

Parameter	Symbol	Min.	Type	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

## 8.3 Measurement Conditions

Table8-3:LCS6260 Power Consumption in Different States

System State	Description	Current (Type)@3.3V
Deep-sleep	Only RTC Power on	20uA
Light-sleep	Receive Beacon packages	0.9mA
DTIM1	The CPU is Power on	1.5mA
Active RX(RF Working)	RX and Listening	45-50mA

Active TX(RF Working)	WIFI TX 13-18dBm	160-280mA
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## 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 802.11 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 ±2dBm 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

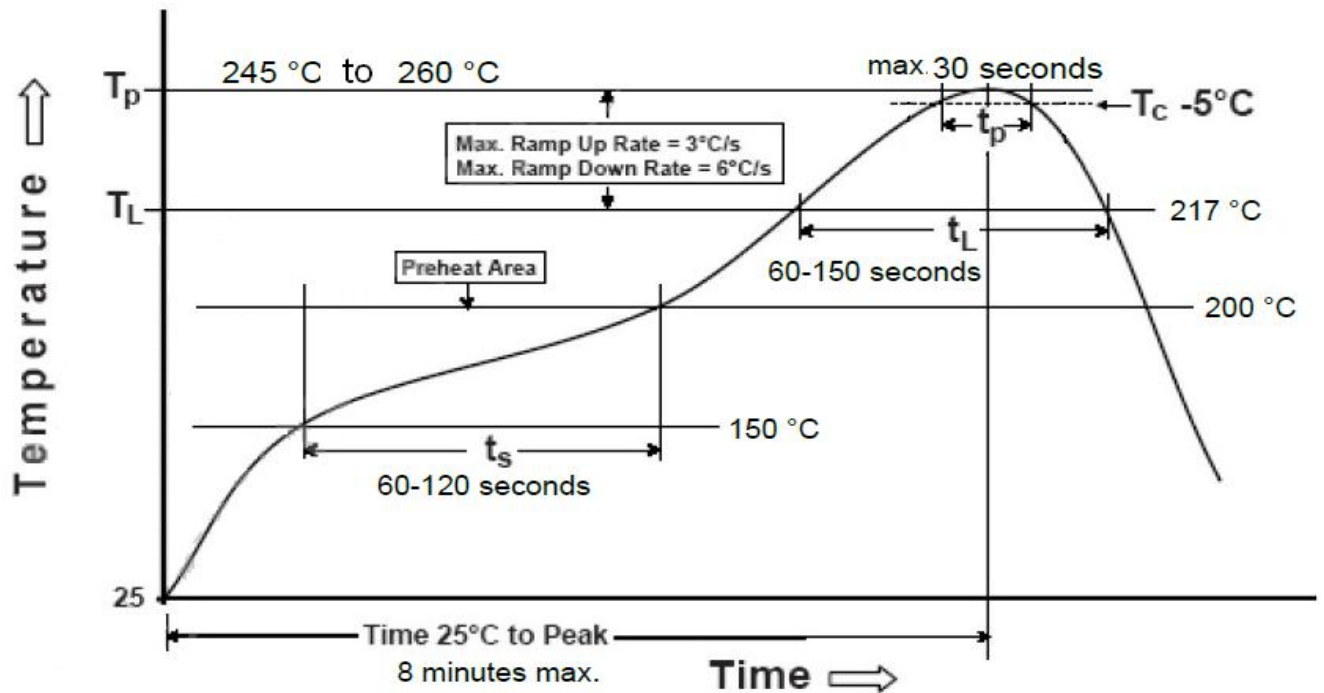


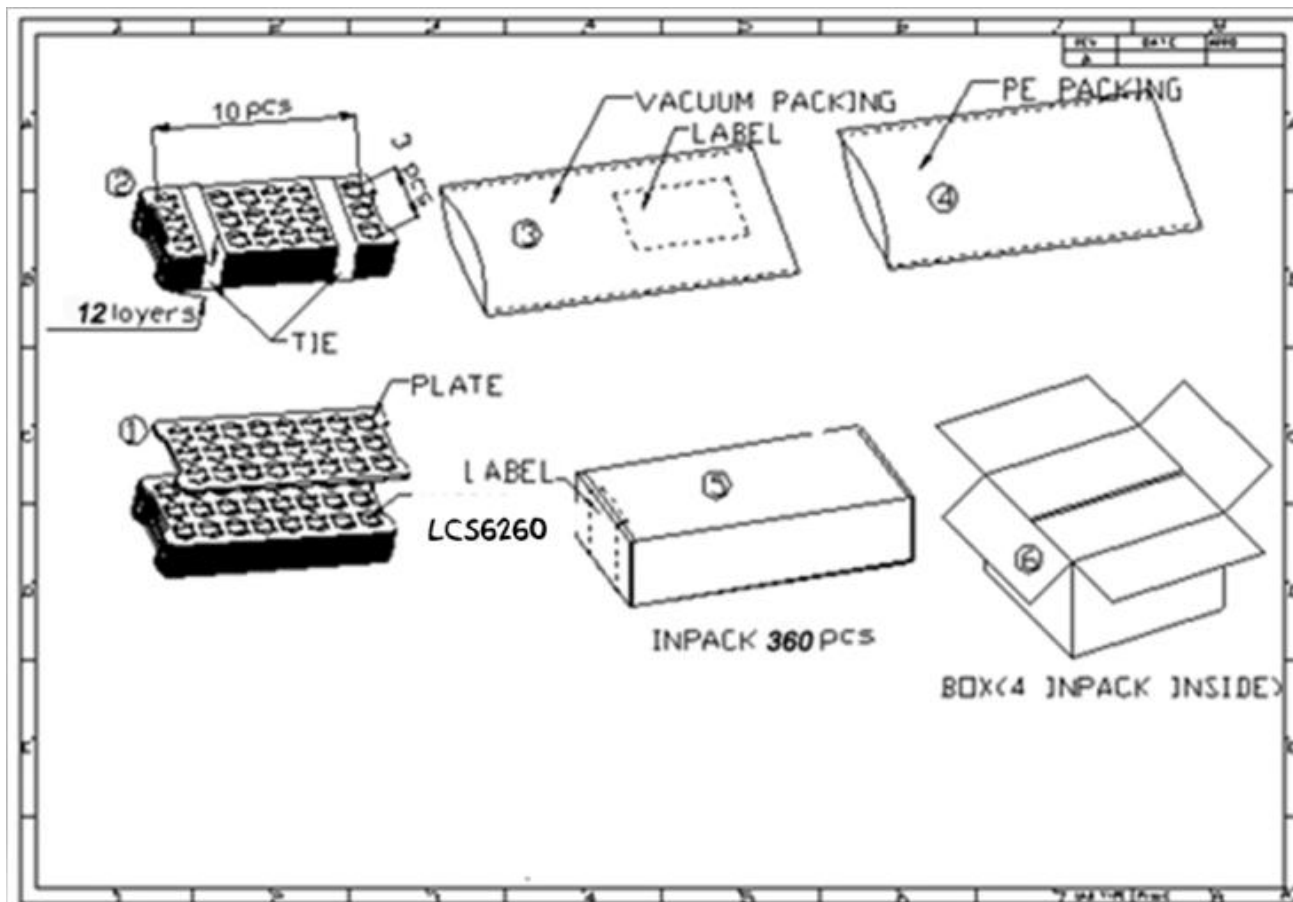
Figure 8: LCS6260 Typical Lead-free Soldering Profile

**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.

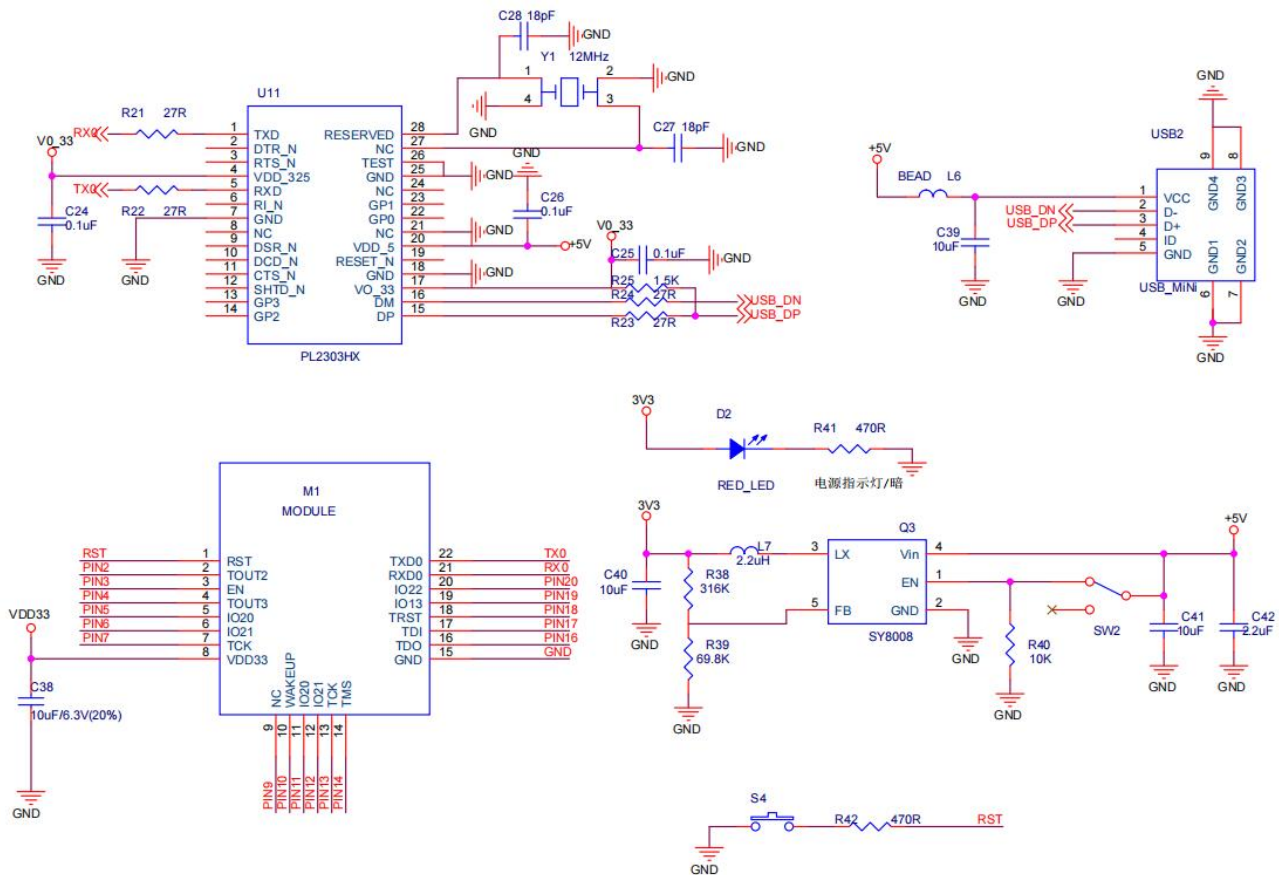
## 11 Ordering Information

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

## 12 Packaging Specification



## 13 Reference Circuit



## 14 Contact Information

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