Accurate
positioning

22°39'48.37"N 114°02'10.91"E

JS-TP26-U

PRODUCT SPECIFICATION

Data Sheet

Shenzhen Jumpstar Technology Co.,Ltd

Email : info@jumpstar-tech.com
Tel : (86) 0755-23732282
Fax : (86) 0755-23732823
Add : Room 213, Building B, Youth Pioneer Park, Jianshe East Road,
Longhua District, Shenzhen, Guangdong Province, China, 518109.

Contents

Change History of Revision

Revision	Date	Contents of Revision Change	Remark
V1.0	2022-10-10	First release	Wang Wei
V1.1	2023-12-16	Fix known errors	Wang Wei

1 Functional description

1.1 Overview

TP26-U adopts GNSS/INS integrated navigation and positioning technology, which effectively solves the situation that satellite signal lock leads to the interruption of positioning results, and further optimizes the continuity and reliability of positioning output in complex environments such as buildings, tunnels and viaducts. Support GPS, GLONASS, Galileo, BDS, SBAS, QZSS(L1 + L5). High-performance six-axis MEMS motion tracking device, combined with three-axis gyroscope and three-axis accelerometer, has acceleration information and high-precision attitude Angle. High precision, high resolution, can capture fine vibration and tilt. The wide range of output makes motion perception possible under large dynamics. All modules are equipped with ultra-wide range of fine temperature compensation and independent calibration before delivery to ensure highly consistent performance across all products.

1.2 Product features

- Supports adaptive installation
- 135 Number of channels (L1:75,L5:60)
- Navigation update rate up to 10Hz
- Indoor and outdoor multi-path detection and compensation
- Low power consumption .Single supply with wide voltage range
- Supports GPS, GLONASS, Galileo, BDS, SBAS ,QZSS(L1 + L5 frequency point)
- Support AGNSS fast auxiliary positioning
- 12multi-tone AIC in both L1 and L5 band for removing unwanted signals
- RTCM ready(RTCM v2.3 and v3.3)
- Integrated TCXO,SAW,RTC
- Supports variant interfaces including UART, USB
- Compact size(16.0mm x 12.2mm x 2.4mm±0.3mm) suitable for space-sensitive application
- Support standard NMEA 0183 V4.1 and backward compliance

1.3 Product Application

- Maritime navigation
- Automotive application

- Intelligent logistics scheduling
- Traffic monitoring
- Fleet Management
- Intelligent driving
- vehicle control
- On-board navigatio

1.4 Performance

Parameter	Specification
Receiver type	■GPS L1CA L5 ■BDS B1I B2a ■Galileo E1B E1C E5a ■GLONASS L1OF ■QZSS L1CA L1SAIF L5 ■SBAS WAAS EGNOS MSAS GAGAN
Sensitivity[1]	Tracking & Navigation -165dBm Acquisition -148dBm
Time-To-First-Fix[2]	Cold Start ≤24s Hot Start ≤1s
Position accuracy[3]	Horizontal 3G+B 1.0m (L1+L5); 2.5m (L1) Vertical 2.25m
Velocity accuracy[4]	0.05m/s
PPS	±10 ns
Horizontal Locating accuracy	GNSS inertial navigation < (span="") 1.5m CEP @ -130 dBm Without aid Sub-meter (3% CEP)
Operational limits	Dynamics 4g Altitude 10000m Velocity 100m/s
Baud Rate	115200 - 921600 bps (Default 115200bps)
Maximum fixed update rate	PVT update rate 10 Hz Raw output rate 1 Hz

✌1 External use of good performance LNA test

✌2 All satellites at -130dBm

✌3 CEP 50%, 24 hours static, -130dBm, > 8SVs

✌4 50% @ 30m/s dynamic operation

2 Hardware Interface Description

2.1 ANT

It is recommended to connect the external GNSS active antenna to the module antenna interface. The internal design of the interface is 50 ohm characteristic impedance to obtain better performance

It is recommended to reserve an external impedance matching circuit. The antenna interface has the feed output function, and the typical feed voltage is 3.3V.

2.2 Power

The TP26-U module contains two input power supplies (VCC and V_BKUP) and one output power supply (VCC_RF). VCC is the main power supply of the module, which supplies power to the on-chip power conversion chip and the on-chip main IC. V_BKUP is the backup power supply of the module, which can still supply power to the RTC circuit and backup RAM in the module even when the main power is off, so as to realize the hot start function and shorten the positioning time. The VCC_RF can feed either an external active antenna (typical supply voltage 3.3V) or an external LNA. The module is connected to the RF_IN through an inductor.

2.3 RST_N

The module integrates the power-on reset function internally and supports the external reset function (effective at low level). The low level is 10ms

The effective. If not used, the signal interface can be suspended.

2.4 TIMEPULSE

Module provides 1 output TIMEPULSE signal with adjustable pulse width and polarity. TIMEPULSE signals can be external systems provides timing function, pulse edge trigger mode and pulse width adjustable, the default output per second pulse.

2.5 UART

TP26-U module provides three groups of serial ports, namely UART0 (TXD0, RXD0), UART1 (TXD1, RXD1) and UART2 (TXD2, RXD2). UART0 supports data transmission and firmware upgrade. The input and output signal types are LVTTL level. The default baud rate is 115200bps and the maximum baud rate is 921600bps. UART1 supports Debug data transmission. The input and output signals are LVTTL level. The recommended baud rate is 921600bps. UART2 is the debugging serial port. The serial port baud rate can be set by the user. When

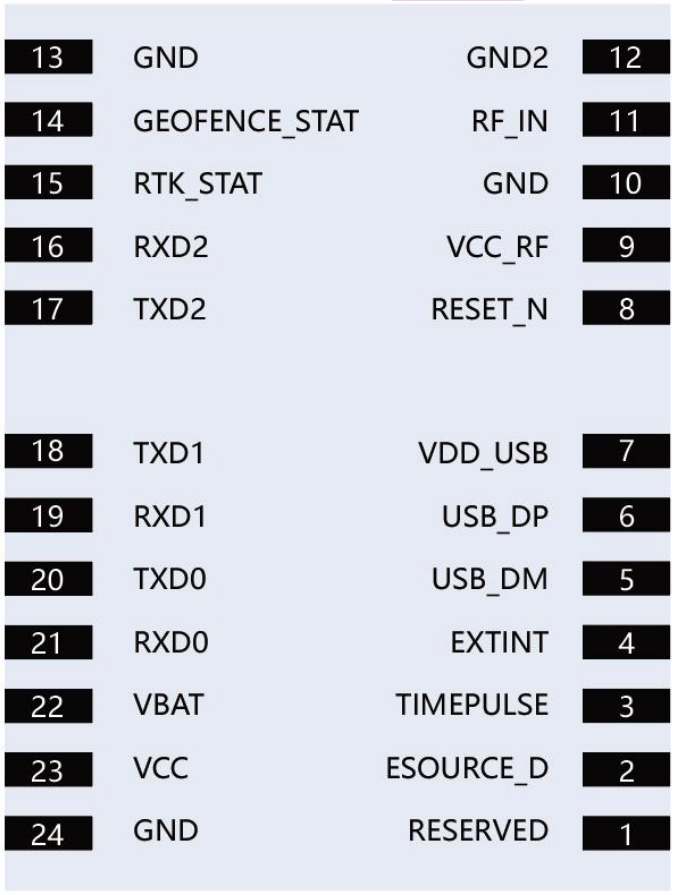
designing the product, ensure that UART0 is connected to a PC or external processor for firmware upgrade.

2.6 EXTINT

The module provides an External Interrupt input pin that can be suspended if not in use. Not available in tacit configuration, but can be customized.

3 Pin definitions

3.1 Pin assignment



PIN脚示意图（Top View）

3.2 Pin assignment

Table 2.1 module PIN definition

No.	Name	I/O	Description
1	RESEVED	-	RESERVED
2	ESOURCE_D	-	RESERVED
3	TIMEPULSE	O	1PPS Time pulse（keep open if not used）

4	EXTINT	I	External interrupt pin（keep open if not used）
5	USB_DM	I/O	USB data（keep open if not used）
6	USB_DP	I/O	USB data（keep open if not used）
7	VDD_USB	I	USB supply（keep open if not used）
8	RESET_N	I	Module reset signal input（Active low，keep open if not used）
9	VCC_RF	O	Voltage for external LNA（keep open if not used）
10,12,13,24	GND	G	Ground
11	RF_IN	I	GNSS signal Input
14	GEOFENCE_STAT	-	RESERVED
15	RTK_STAT	-	RTK_STAT
16	RXD2	I	UART2-RXD
17	TXD2	O	UART2-TXD
18	TXD1	O	UART1-TXD
19	RXD1	I	UART1-RXD
20	TXD0	O	UART0-TXD（Data transfer and firmware upgrade，LVTTL）
21	RXD0	I	UART0-RXD（Data transfer and firmware upgrade，LVTTL）
22	VBAT	P	Backup voltage supply
23	VCC	P	Main supply

4 Electrical specifications

4.1 Absolute maximum

Parameter	Symbol	Min	Max	Unit	Condition
Power supply voltage	Vcc	-0.5	3.6	V	--
VCC maximum ripple	Vrpp	0	50	mV	--
Input pin voltage	Vin	-0.5	Vcc+0.2	V	--
ESD	VESD(HBM)	--	2000	V	All pins
MSD(MSL) Level	Level 3				

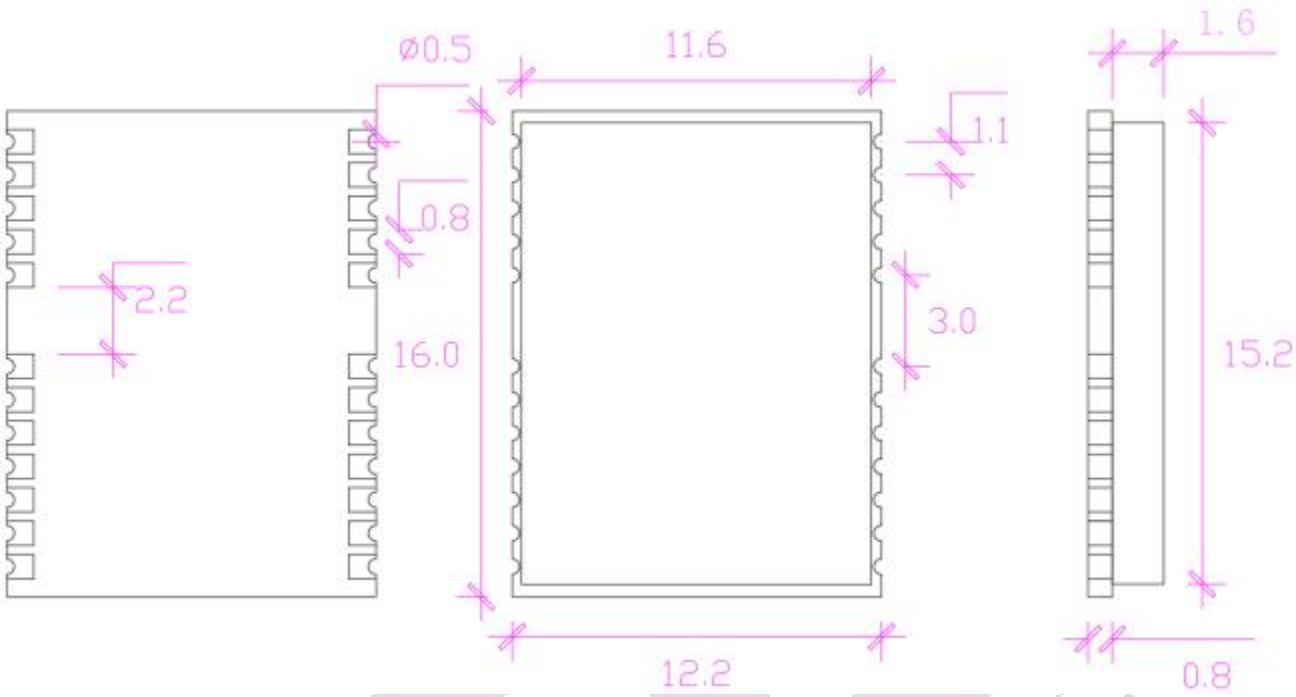
4.2 Operation conditions

Parameter	**Symbol**	**Min**	**Type**	**Max**	**Units**
Power supply voltage	VCC	3.0	3.3	3.6	V
VDD_USB	VDD_USB	3.0	3.3	3.6	V
Average supply current	Acquisition	35@3.3V	42@3.3V	49@3.3V	mA
	Tracking	31@3.3V	36@3.3V	44@3.3V	mA
Backup battery voltage	V_BACK	1.65	3.3	3.6	V
Backup battery current	I_BACK		10		uA
Digital IO voltage	Div	3.0		3.3	V
Storage temperature	Tstg	-40		85	°C
Operating temperature	Topr	-40		85	°C
Humidity				95	%

4.3 Protocol

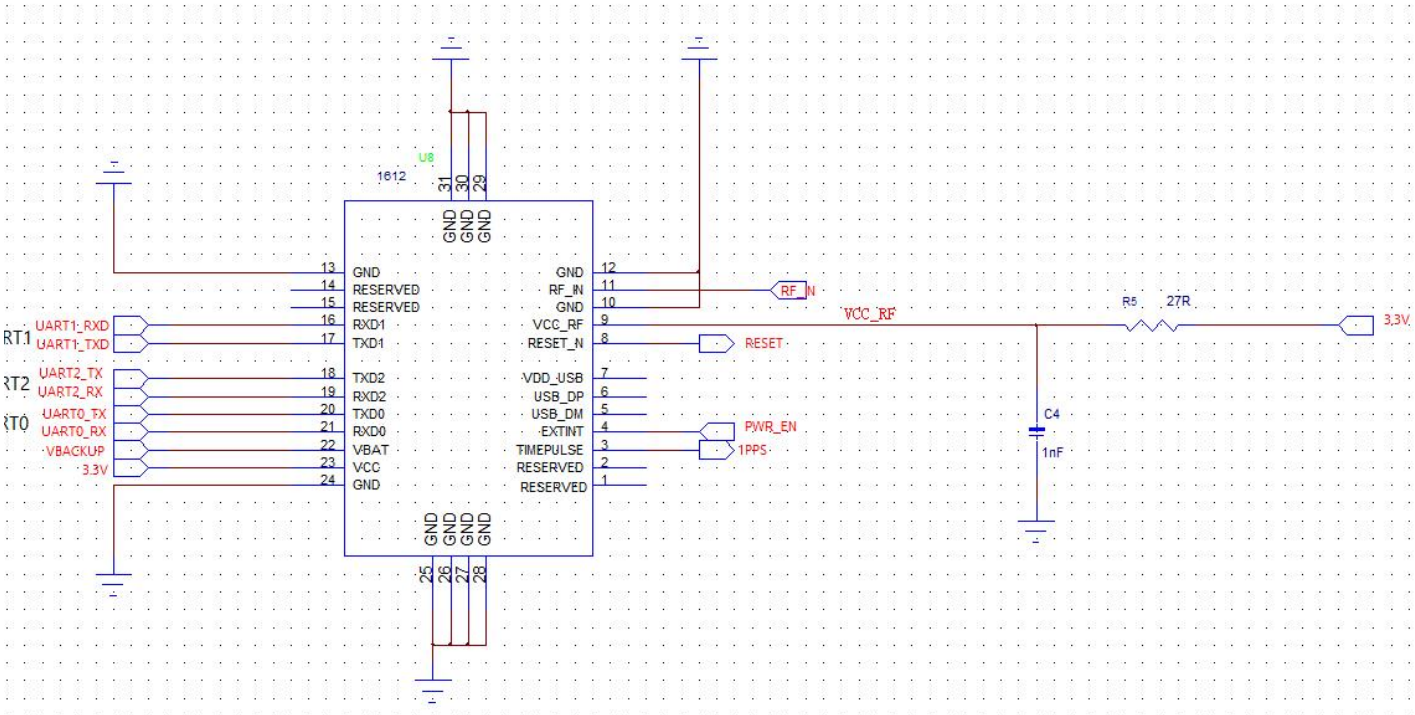
Protocol	**Type**
NMEA 0183 V4.1	Out put/In put

5 Pin assigment

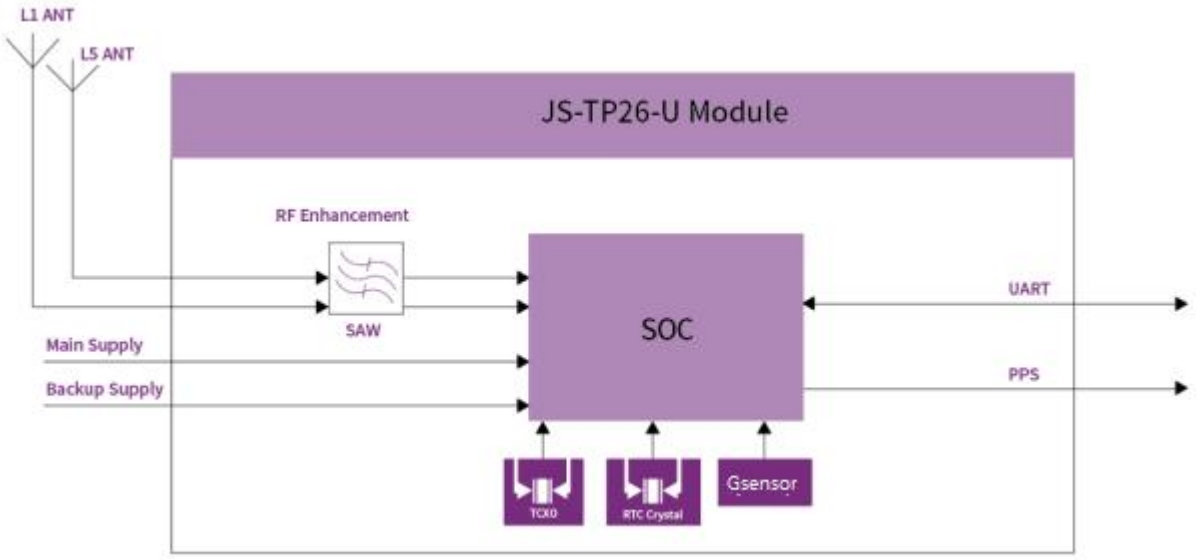


units: mm dimension error ±0.3mm

6 Application Circuit



Block Diagram



7 Module installation and initialization

7.1 Module Installation Description

1) The module needs to be fixed on the vehicle to ensure that the module is connected with the rigid body of the car;

2) The adaptive installation mode has no requirements on the installation direction;

3) Do not move the device after it is powered on;

4) The mileage timing of this product is in ADR mode, and the mileage timing is in UDR mode without instruction configuration.

7.2 Initialization Description

The initialization steps are as follows:

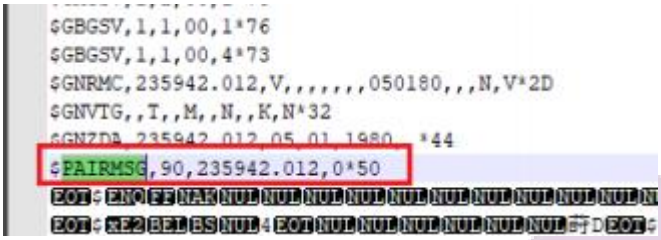
1) After the system is powered on, leave it for at least 5-10 seconds to complete attitude initialization of the navigation system,the DR stage will become 1(see the $PAIRMSG,90,<UTC>,<DR stage>,*CS message);

2) In the process of driving, the vehicle needs to move in the open area for a period of time, including left and right turns and straight line driving. At the same time, the speed should be guaranteed to 10KM/H, and the DR stage will become 3 (see the $PAIRMSG,90,<UTC>,<DR stage>,*CS message), and only after it becomes 3 can

the pure inertial navigation trajectory be tested in places where there is no GNSS signal at all, such as underground parking lots and tunnels, so as to achieve algorithm convergence of the integrated navigation system, and then the test is carried out in complex environments such as tunnels;

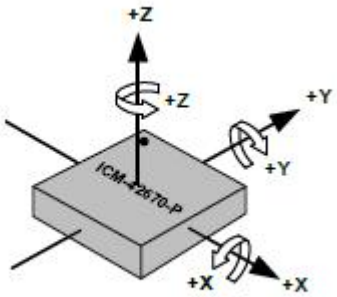
3) The above steps need to be in place after the equipment to start the car training.

Note: Alignment is finished when the DR stage is 3. Check it at $PAIRMSG,90.
$PAIRMSG,90,<UTC>,<DR stage>,*CS. This message appears below on the powergps tool (only available on. version 4.5.23)



■ DR stage

• DR_SOLUTION_UNKNOWN = 0
• DR_SOLUTION_INIT = 1
• DR_SOLUTION_COARSE = 2
• DR_SOLUTION_STABLE = 3



8 ROHS

This product is RoHS compliance

9 Recommended Reflow Profile (If need)

9.1 GNSS module before the SMT note:

9.1.1 When customers Open stencil must be sure the hole bigger to the GNSS module plate, please press 1 to

1 and 0.7 mm is widened to open outward, the thickness of 0.12 mm.

9.1.2 Can't get the GNSS module bare hands when needs, must we wear the gloves and static ring.

9.1.3 The furnace temperature according to the size of the customer the main board, generally like to stick on a tablet standard temperature of 250 + - 5, can do 260 + - 5.

9.2 Storage and use GNSS module control should pay attention to the following matters:

9.2.1 Storage life: 12 months. Storage conditions:<40℃. Relative humidity: <90%R.H.

9.2.2 After this bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing must be.

9.2.3 Check the humidity card: stored at ≦20%RH. If: 30%~40%(pink)or greater than 40%(red). Labeling module has moisture absorption.

9.2.4 Mounted within 168 hours at factory conditions of t≦30%℃, ≦60%R.H.

9.2.5 Once opened, the preservation of life in the workshop is 168 hours.

9.3 If baking is required, devices may be baked for:

9.3.1 Modules must be to remove module moisture problem.

9.3.2 Baking temperature: 125 ℃, 8 hours.

9.3.3 After baking, put the proper amount of desiccant to seal packages.

9.4 The actual number of module vacuum packing which is based on the actual number of packages to the customer requirements.

9.5 Module reel packaging items as follows.

9.5.1 Storage life: 12 months. Storage conditions: <40℃. Relative humidity: <90%R.H.

9.5.2 Module apart packing after 168 hours, To launch patch need to bake, to remove the module hygroscopic, baking temperature conditions: 125℃, 8hours.

9.5.3 The actual number of module reel packing which is based on the actual number of packages to the customer requirements.

9.6 Module pallet packaging items as follows:

9.6.1 Storage life: 3 months. Storage conditions: <40℃. Relative humidity: <90%R.H.

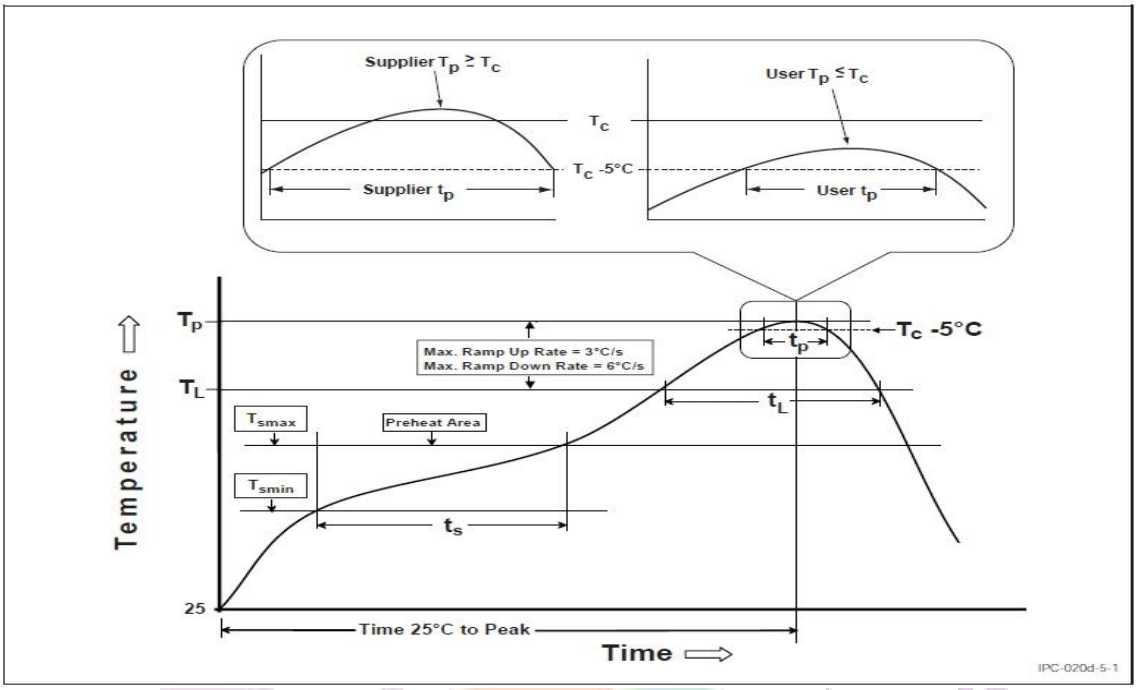
9.6.2 Module if not used within 48 hours, before launching the need for baking, baking temperature: 125 ℃, 8 hours.

9.6.3 Pallet packaging each plate is 100 PCS. The actual number of module pallet packing which is based on the actual number of packages to the customer requirements.

9.6.4 Pb-Free Process-Classification Temperatures(Ta)

Package Thickess	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6 mm	260° C	260° C	260° C
1.6mm - 25 mm	260° C	250° C	245° C
>2.5 mm	250° C	245° C	245° C

9.6.5 temperature curve



Profile Feature	Pb-Free Assembly
Preheat/Soak Temperature Min (T_{smin}) Temperature Max (T_{amax}) Time (t_s)from (T_{smin} to T_{smax})	 150 ℃ 200 ℃ 60-120 seconds
Rise speed rate (T_L to T_P)	3°C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	217 ℃ 60-150 seconds
Encapsulated peak temperature (T_p)	Cannot exceed Tc(T_C=260℃)
Time(t_P)* within 5°C of the specified classification temperature (T_C)	30* seconds
Rate of decline (T_P to T_L)	6°C/ second max
Time 25 °C to peak temperature	8 minutes max
*Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.	

* The time above 255℃ should not exceed 30 seconds