FSC-GS8007MV

DATASHEET V1.0

Revision History

Version	Data	Notes	Author
V1.0	2025-10-10	Initial Version	Liu

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1 INTRODUCTION

Overview

The FSC-GS8007MV supports the reception of GPS, BDS, Galileo, and QZSS satellite signals, with an optional integrated internal IMU. It delivers accurate positioning services even in harsh environments such as tunnels, high-rise buildings, and underground garages.

This is a highly integrated System-in-Package (SiP), low-power, RFSOC GPS receiver with an application processor GPS L1+L5 receiver, a power management unit (PMU).

Equipped with an ARM® Cortex®-M4F application processor, the FSC-GS8007MV operates at a frequency range of 26MHz to 530MHz. It achieves high performance and power efficiency through a Level 1 (L1) cache.

The GPS subsystem includes RF and baseband circuits. These circuits support simultaneous tracking of L1+L5 satellites and enable GPS satellite searching via the L1+L5 frequency bands.

The FSC-GS8007MV offers automotive Grade 2 (–40°C to +105°C) ambient operating temperature performance, while being AEC-Q100 Group A Grade 2 compliant.

Features

- **Supporting feature**:
  - L1 + L5 Dul-band GNSS receiver
  - Support 75 tracking channel in L1
  - Multi-Constellation GPS / GLONASS / Galileo / BeiDou / QZSS receiver
  - Support for SBAS ranging, WAAS, EGNOS, MSAS and GAGAN
  - Integrated 12 multi-tone active interference Cancellers
  - RTCM ready (RTCM v2.3 and v3.3)
  - Indoor and outdoor multi-path detection and Compensation
  - Horizontal Position Accuracy < 1.5m CEP50
  - Vertical Position Accuracy < 2.25m CEP50
  - Velocity Accuracy: 0.05m/s
  - Position error during GNSS loss: typical 10% distance travelled
  - Maximum navigation update rate (PVT): 10Hz
  - TTFF
    - With AGNSS: Cold Start: < 1 s
    - Without AGNSS: Cold Start: < 32s, Warm Start < 32s, Hot Start < 1s
  - Sensitivity:

- Acquisition: -145dBm
- Tracking: -163dBm
- Reacquire: -157dBm

- Operational Limits (Max.)
  - Altitude: 18000m
  - Velocity: 500m/s
  - Acceleration: 4G

Software Features:

- EPOTM orbit prediction
- EASYTM self-generated orbit prediction
- LOCUSTM logger function
- Support for time service application, which is Achieved by the PPS vs NMEA feature

GNSS Constellations and Frequency Bands

System	Signals
GPS	L1 C/A: 1575.42 MHz L5: 1176.45 MHz
Galileo	E1: 1575.42 MHz E5a: 1176.45 MHz
BDS	B1I: 1561.098 MHz B2a: 1176.45 MHz
QZSS	L1 C/A: 1575.42 MHz L5: 1176.45 MHz

2 GNSS characteristics

Table 3-1：General Specifications

Categories	Features	Implementation
Chip type		AG3335MA
Sensitivity	Acquisition Reacquisition Tracking	-145dBm -157dBm -163dBm
TTFF	Cold Start Warm Start Hot Start	32S 32S 1S
Positional accuracy	CEP90% CEP50%	3m 1.5m
Update Rate (Max.)	GNSS RAW Data RTCM	10Hz 10Hz
PPS	PPS (pulse per second)	20ns
Velocity Accuracy	Without Aid	0.1m/s
Acceleration Accuracy	Without Aid	0.1m/s
Dynamic Performance	Maximum Altitude: Maximum Velocity: Maximum Acceleration:	18000m 515m/s 4g
Size		17 mm × 22 mm × 3.0 mm
Operating temperature		-40°C ~+85°C
Storage temperature		-40°C ~+105°C
Supply Voltage(VCC)		3.0V~3.6V, Typical：3V3
Supply Voltage(V_BCKP)		3.0V~3.6V, Typical：3V3
Miscellaneous	Lead Free Warranty	Lead-free and RoHS compliant One Year
Humidity		10% ~ 90% non-condensing
MSL grade		MSL 3
ESD grade		Human Body Model: Pass ±2000 V Charge device model: Pass ±500 V RF Pins: Pass ±250 V

3 HARDWARE SPECIFICATION

3.1 Block Diagram and PIN Diagram

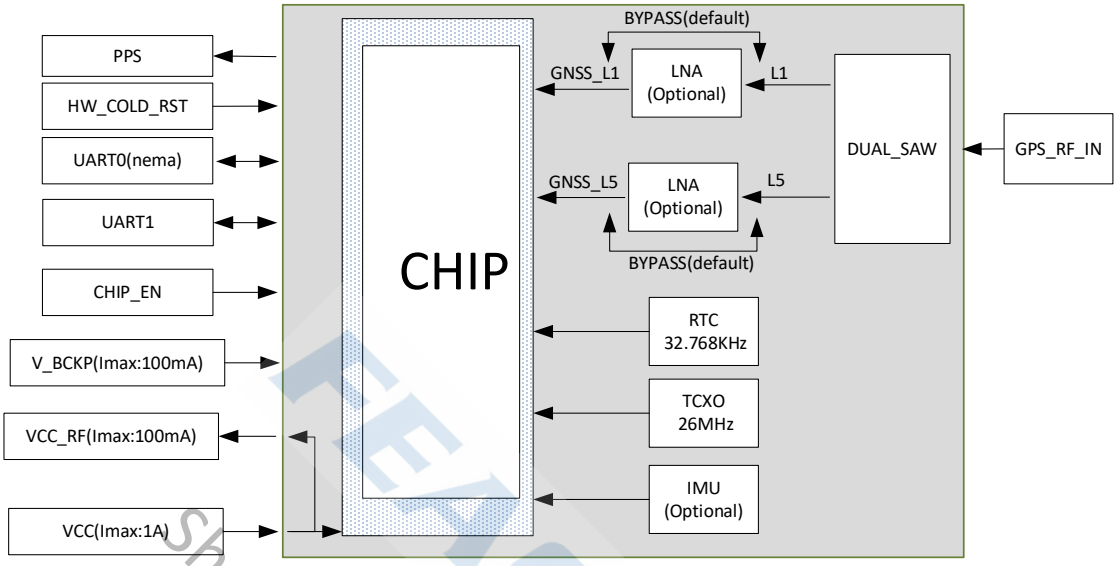


Figure 3-1-1: FSC-GS8007MV Block Diagram

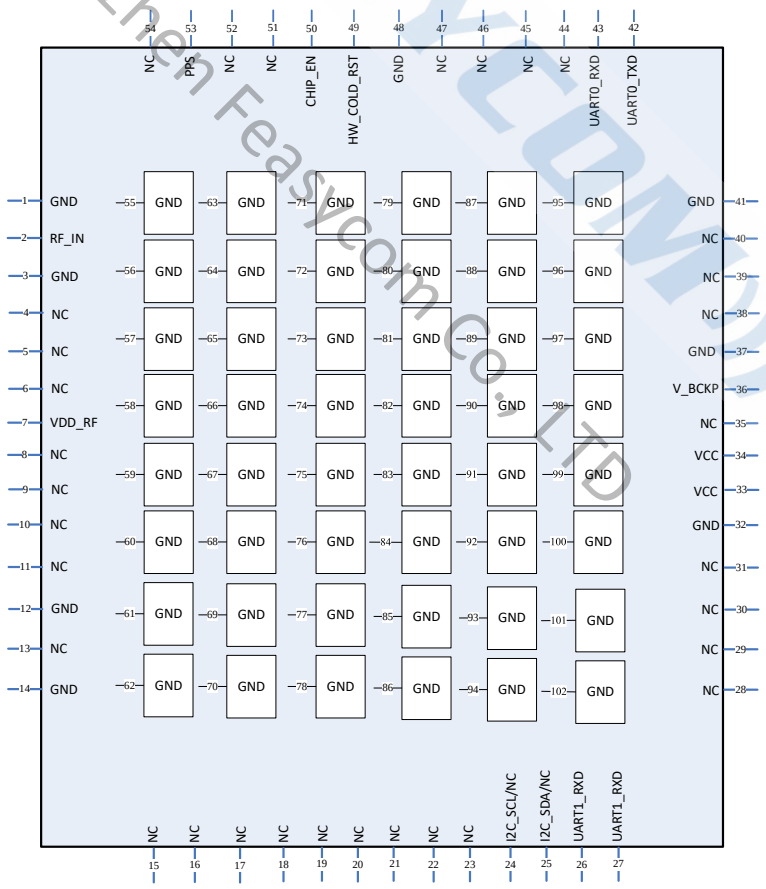


Figure 3-1-2: FSC-GS8007MV PIN Diagram (Top View)

3.2 PIN Definition Descriptions

LGA package, as shown in the figure below.

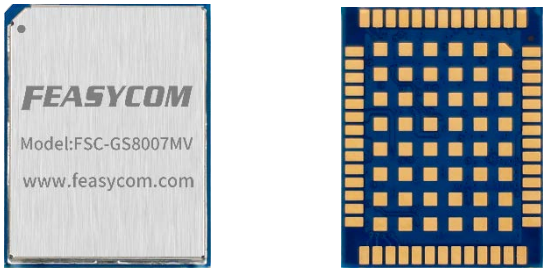


Figure 3-2-1: FSC-GS8007MV Package Module Appearance

3.3 PIN Definition Descriptions

Table 3-3： Pin definitions

Pin	Pin Name	Type	Pin Descriptions
1	GND	GND	Ground
2	RF_IN	I	GNSS RF Input
3	GND	GND	Ground
4	NC		
5	NC		
6	NC		
7	VCC_RF	O	Voltage for external LNA; If unused, leave the pins N/C
8	NC		
9	NC		
10	NC		
11	NC		
12	GND	GND	Ground
13	NC		
14	GND	GND	Ground
15	NC		
16	NC		
17	NC		
18	NC		
19	NC		
20	NC		
21	NC		
22	NC		
23	NC		
24	I2C_SCL/NC	I/O	I2C serial clock for IMU(Option); If unused, leave the pins N/C

25	I2C_SDA/NC	I/O	I2C serial data for IMU(Option); If unused, leave the pins N/C
26	UART1_RXD	I	Input RTCM Raw data(Option); If unused, leave the pins N/C
27	UART1_TXD	O	Output RTCM Raw data(Option); If unused, leave the pins N/C
28	NC		
29	NC		
30	NC		
31	NC		
32	GND	GND	Ground
33	VCC	I	Supply Main voltage
34	VCC	I	Supply Main voltage
35	NC		NC
36	V_BCKP	I	Backup supply voltage(RTC), If a hot start is required, the device must remain powered on
37	GND	GND	Ground
38	NC		
39	NC		
40	NC		
41	GND	GND	Ground
42	UART0_TXD	I	Output NEMA/ Programming Firmware
43	UART0_RXD	O	Input NEMA/ Programming Firmware
44	NC		
45	NC		
46	NC		
47	NC		
48	GND	GND	Ground
49	HW_COLD_RST	I	RESET for RTC; Pulled up internally by default. Low Active
50	CHIP_EN	I	CHIP_EN; Pulled up internally by default. Low Active
51	NC		
52	NC		
53	PPS	O	Time pulse(1PPS)
54	NC		
55~102	GND	GND	Ground

4 Electrical Specification

Table 4-1: MSL and ESD

Parameter	Value
MSL grade	MSL 3
ESD grade	Electrostatic discharge
ESD – Human-body model (HBM) rating, JESD22-A114-F (Total samples from one wafer lot)	Pass ±2000 V
ESD – Charge-device model (CDM) rating, JESD22-C101-D (Total samples from one wafer lot)	Pass ±500 V

Table 4-2: Absolute Maximum Ratings

Parameter	Min	Type	Max	Unit
Supply Voltage (VCC)	0	3.3	3.6	Volt
V_BCKP	0	3.3	3.6	Volt
Input Power at RF_IN			+20	dBm
Operation Temperature	-40		85	℃
Storage Temperature	-40		105	℃

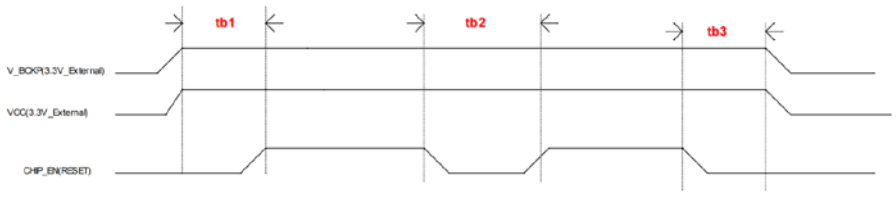
5 Backup Supply

When the positioning system is not in use, it can enter the low-power mode by powering the VBACK pin. This pin only supplies power to the system's RTC to ensure the basic operation of the system and to achieve rapid initial positioning.

6 PPS

When the module uses 3D positioning, The PPS pin will output a pulse waveform that occurs once every second. is aligned with the UTC seconds, and the accuracy is about 20ns. When it is not positioned, it outputs a constant low pulse.

7 Power -up and power-down sequence



Symbol	Parameter	TYP	Max	Units
tb1	V_BCKP/VCC to CHIP_EN input active	50	100	ms
tb2	CHIP_EN Valid time	30	50	ms
tb3	V_BCKP/VCC to CHIP_EN input inactive	50	100	ms

Figure 7-1: FSC-GS8007MV Power-up and power-down sequence

8 UART Parameters

Table 8-1：UART Parameters

Parameter	Possible Values
Baud rate	Minimum: 110bps Standard: 921600bps Maximum: 921600bps
Parity	None, Odd or Even
Number of stop bits	1
Bits per channel	8

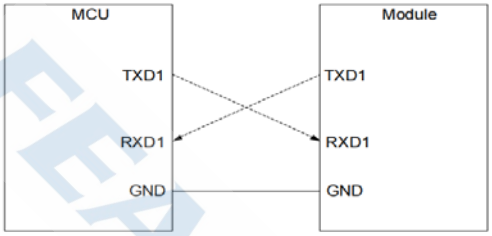


Figure 8-1: UART Interface Reference Design

9 MECHANICAL DETAILS

9.1 Mechanical Details

- Dimension: 17mm(W) x 22mm(L) x 3.0mm(H) Tolerance: ±0.2mm
- Module size: 17mm X 22mm Tolerance: ±0.2mm
- Pad size: 1.5mmX0.8mm,1.1mmX1.1mm Tolerance: ±0.2mm
- Pad pitch: 1.1mm Tolerance: ±0.1mm

(分板后边角残留板边误差：≤ 0.5mm) (Residual plate edge error: ≤ 0.5mm)

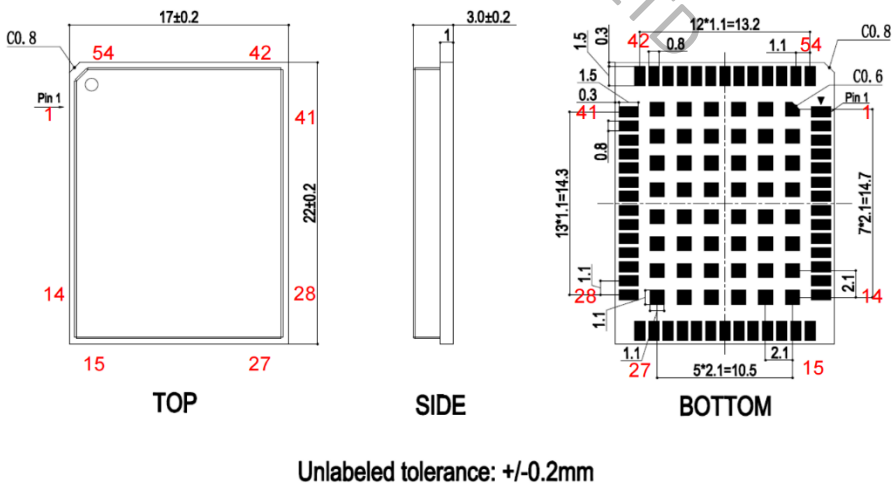


Figure 9-1: FSC-GS8007MV package dimensions diagram

10 Layout Guidelines (External Antenna)

For modules without an on-board antenna design, PCB placement and layout are critical to optimizing performance. The trace connecting the module's antenna port to an external antenna must have a 50Ω characteristic impedance and be kept as short as possible to avoid interfering with the module's transceiver. When positioning the external antenna and the module's RF-IN port, they should be kept away from noise sources and digital traces. A matching network may be required between the external antenna and RF-IN port to minimize return loss and achieve better impedance matching.

To ensure optimal RF performance, the module's RF-critical circuits must be clearly separated from digital circuits on the system board. Since the module's internal RF circuits are located near the antenna port, the module should be placed such that its digital section faces the digital area of the system PCB.

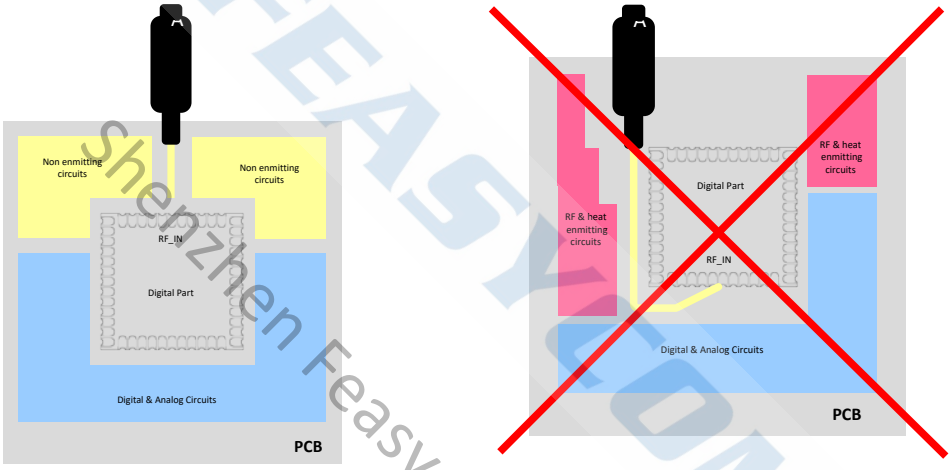


Figure 10-1: Placement the Module on a System Board

10.1.1 Antenna Connection and Grounding Plane Design

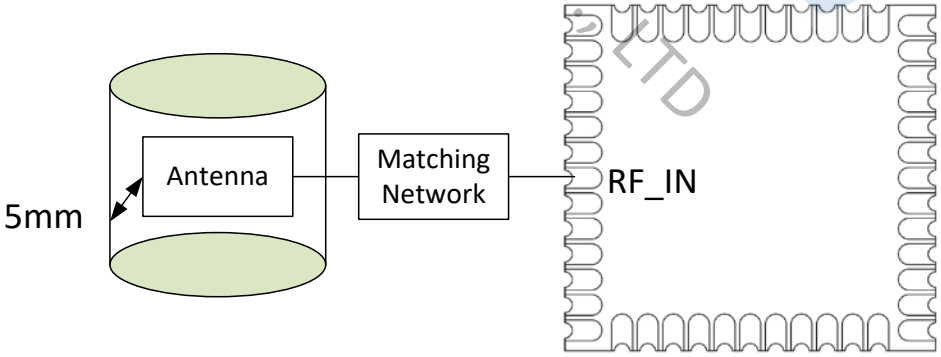


Figure 10-1-1: Leave 5mm Clearance Space from the Antenna

General Design Recommendations are:

- The length of the trace or connection line should be kept as short as possible.
- Distance between connection and ground area on the top layer should be at least as large as the dielectric thickness.
- Routing the RF close to digital sections of the system board should be avoided.
- To reduce signal reflections, sharp angles in the routing of the micro strip line should be avoided. Chamfers or fillets are preferred for rectangular routing; 45-degree routing is preferred over Manhattan style 90-degree routing.

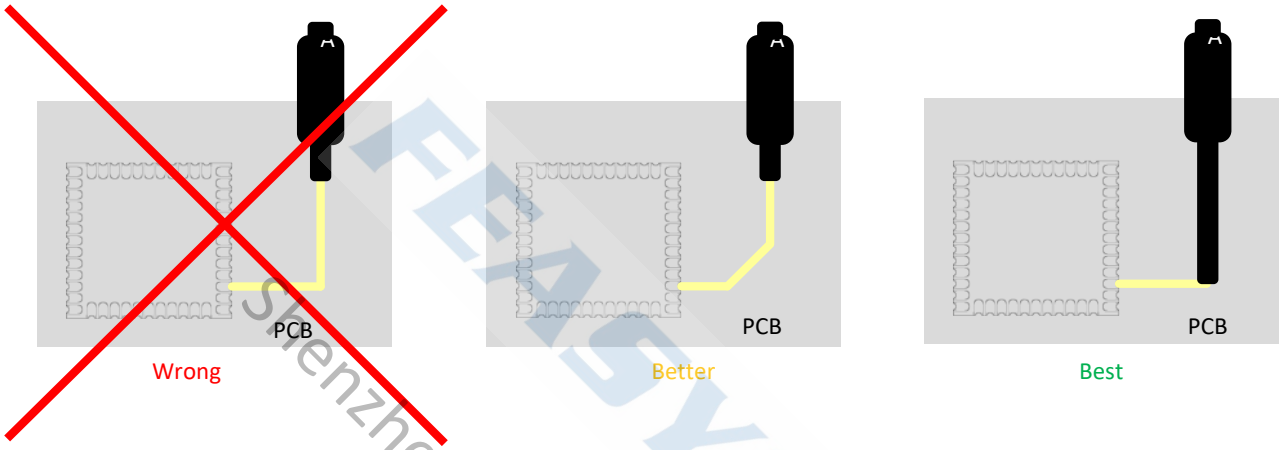


Figure10-1-2: Recommended Trace Connects Antenna and the Module

- Routing of the RF-connection underneath the module should be avoided. The distance of the micro strip line to the ground plane on the bottom side of the receiver is very small and has huge tolerances. Therefore, the impedance of this part of the trace cannot be controlled.
- Use as many vias as possible to connect the ground planes.

11 RECOMMENDED TEMPERATURE REFLOW PROFILE

Prior to reflow soldering, proper packaging of the modules is critical to prevent moisture absorption. New packages are equipped with desiccants for moisture absorption and include a humidity indicator card (HIC) to monitor moisture levels during storage and shipment. If the card indicates the need for baking, refer to and follow the requirements specified in IPC/JEDEC J-STD-033 to avoid moisture-related issues during reflow.

Note: The shipping tray must not be exposed to temperatures exceeding 65°C. If baking is required at temperatures higher than this, remove the modules from the shipping tray first. This precaution prevents potential heat-induced damage or deformation of the tray.

Modules that exceed their floor life but remain unused must be repackaged with new desiccants and humidity indicator cards. For devices with a Moisture Sensitivity Level (MSL) of 3, the floor life is 168 hours under ambient conditions of 30℃/60% RH.

Floor life is defined as the maximum allowable time a moisture-sensitive device can be exposed to ambient conditions without risking moisture absorption and subsequent soldering-related damage.

Note：

The Feasycom's module must be used with a Step-Stencil. It is suggested to use a stencil thickness of approximately 0.16-0.2mm, which can be modified according to the product.

Table 11-1: Recommended baking times and temperatures

MSL	125°C Baking Temp.		90°C/≤ 5%RH Baking Temp.		40°C/ ≤ 5%RH Baking Temp.	
	Saturated @ 30°C/85%	Floor Life Limit + 72 hours @ 30°C/60%	Saturated @ 30°C/85%	Floor Life Limit + 72 hours @ 30°C/60%	Saturated @ 30°C/85%	Floor Life Limit + 72 hours @ 30°C/60%
3	9 hours	7 hours	33 hours	23 hours	13 days	9 days

Feasycom surface-mount modules are designed for ease of manufacturing, including reflow soldering onto PCBs. However, it is the customer's responsibility to select appropriate solder paste and ensure that reflow oven temperatures meet the specifications of the solder paste manufacturer. Feasycom surface-mount modules comply with J-STD-020D1 standards for reflow temperature requirements.

Soldering profiles may vary based on different parameters, requiring application-specific setups. The data provided herein is intended solely as a general guideline for solder reflow and should be used for reference purposes only.

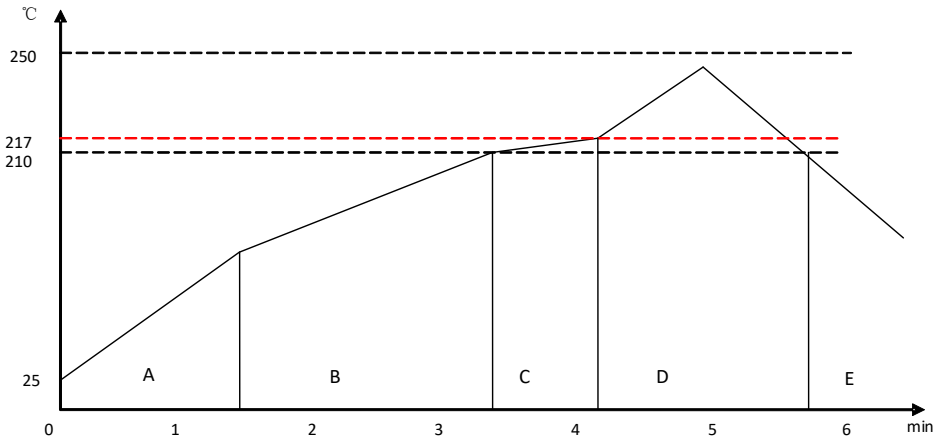


Figure11-1-1：Typical Lead-free Re-flow

Pre-heat Zone (A) — This zone gradually increases the temperature at a controlled rate, typically 0.5 to 2 °C/s. Its purpose is to preheat the PCB and components to 120–150 °C, ensuring uniform heat distribution across the PCB and complete removal of residual solvents. This minimizes the risk of thermal shock to components.

Equilibrium Zone 1 (B) — In this stage, the flux undergoes softening and uniformly covers the solder particles, as well as spreading over the PCB board. This process helps prevent re-oxidation of the solder particles. Additionally, as the temperature rises and the flux liquefies, each activator and rosin component become activated. They work together to eliminate any oxide film formed on the surface of the solder particles and PCB board. **For this zone, it is recommended to maintain a temperature range of 150 to 210 °C for a duration of 60 to 120 seconds.**

Equilibrium Zone 2 (C) (optional) — To address the issue of upright components, it is recommended to maintain a temperature range of 210 to 217 °C for a duration of approximately 20 to 30 seconds. This will help ensure proper soldering and alignment of the components on the PCB board.

Reflow Zone (D) — The profile in the figure is designed for Sn/Ag3.0/Cu0.5. It can be a reference for other lead-free solder. The peak temperature should be high enough to achieve good wetting but not so high as to cause component discoloration or damage. Excessive soldering time can lead to intermetallic growth which can result in a brittle joint. The recommended peak temperature (Tp) is 230 ~ 250 °C. The soldering time should be 30 to 90 second when the temperature is above 217 °C.

Cooling Zone (E) — The cooling ate should be fast, to keep the solder grains small which will give a longer-lasting joint. **Typical cooling rate should be 4 °C.**

12 NMEA 0183 Protocol

The output protocol supports NMEA-0183 standard. The implemented messages include GGA, GLL, GSA, GSV, VTG, RMC, and ZDA messages. The NMEA message output has the following sentence statement structure:

Table 12-1: Introduction to the beginning of the NEMA0183 field

Field header	explain
$GNGGA	Time, position, and fix related data of the receiver.
$GNGLL	Position, time and fix status.
$GNGSA	Used to represent the ID of satellites which are used for position fix. When GPS &GLONASS &Galileo & BDS satellites are used for positioning solutions, the ID of available positioning satellites is counted and output with multiple statements.
$GPGSV $GLGSV $GAGSV $GBGSV	Satellite information about elevation, azimuth and CNR, satellites are used in position solution, $GPGSV sentence is used for GPS satellites. $GLGSV sentence is used for GLONASS satellites. $GAGSV sentence is used for GALILEO satellites. $BDGSV sentence is used for BDS satellites.
$GNRMC	Time, date, position, course and speed data.
$GNVTG	Course and speed relative to the ground.
$GNZDA	UTC, day, month and year and time zone.

12-1 GGA – Global Positioning System Fix Data

Time, position and fix related data for a GNSS receiver.

statement structure:

$GNGGA,hhmmss.sss,ddmm.mmmm,a,dddmm.mmmm,a,x,xx,x.x,x.x,M,x.x,M,x.x,xxxx*hh

For example:

$GNGGA,073650.000,2235.3640,N,11351.6143,E,2,55,0.62,39.0,M,-3.0,M,,*56

Table 12-2-1: GGA Statement Parsing

Field	type	data	Description
1	UTC Time	073650.000	hhmmss.sss
2	Latitude	2235.3640	ddmm.mmmm（If the leading digits are insufficient, add zeros.）
3	N/S Indicator	N	Latitude hemisphere indicator, ‘N’ = North, ‘S’ = South
4	Longitude	11351.6143	ddmm.mmmm（If the leading digits are insufficient, add zeros.）
5	E/W Indicator	E	Longitude hemisphere indicator, ‘E’ = East, ‘W’ = West
6	GPS positioning status	2	GPS status: 0 = unavailable (FIX NOT valid), 1 = single-point positioning (GPS FIX), 2 = differential positioning (DGPS), 3 = invalid PPS, 4 = real-time differential positioning (RTK FIX), 5 = RTK FLOAT, 6 = in estimation process

7	Satellites Used	55	Number of satellites in use
8	HDOP	0.62	Horizontal dilution of precision, (0.0 ~ 99.9)
9	Altitude	39.0	height above sea level
10	unit	meter	unit
11	Geoidal Separation	-3.0	
12	unit	meter	unit
13	Differential time	/	
14	DGPS Station ID	/	
15	Checksum	56	

12-2 GLL – Geographic location information

Position, time and fix status.

statement structure:

$GNGLL,ddmm.mmmm,a,dddmm.mmmm,a,hhmmss.sss,A,a*hh

For example:

$GNGLL,2235.3640,N,11351.6143,E,073650.000,A,D*45

Table 12-2-1: GLL Statement Parsing

Field	type	data	Description
1	Latitude	2235.3640	ddmm.mmmm（If the leading digits are insufficient, add zeros.）
2	N/S Indicator	N	Latitude hemisphere indicator, 'N' = North, 'S' = South
3	Longitude	11351.6143	ddmm.mmmm（If the leading digits are insufficient, add zeros.）
4	E/W Indicator	E	Longitude hemisphere indicator, 'E' = East, 'W' = West
5	UTC Time	073650.000	hhmmss.sss
6	Status	A	Status, 'A' = Data valid, 'V' = Data not valid
7	Mode Indicator	D	Mode indicator 'N' = Data not valid 'A' = Autonomous mode 'D' = Differential mode 'E' = Estimated (dead reckoning) mode
8	Checksum	45	

12-3 GSA – Global Positioning Active Satellites

GNSS receiver operating mode, satellites used in the navigation solution reported by the GGA sentence and DOP values.

statement structure:

$GNGSA,A,x,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,x.x,x.x,x.x,x*hh

For example:

$GNGSA,A,3,23,31,12,195,199,196,21,25,28,10,32,,0.98,0.62,0.76,1*39

$GNGSA,A,3,77,65,76,66,67,,,,,,,0.98,0.62,0.76,2*05

$GNGSA,A,3,02,25,03,05,15,24,08,,,,,0.98,0.62,0.76,3*0E

$GNGSA,A,3,23,39,38,09,25,32,37,33,07,40,06,41,0.98,0.62,0.76,4*0B

$GNGSA,A,3,13,16,,,,,,,,,,0.98,0.62,0.76,4*05

Table 12-3-1: GSA Statement Parsing

Field	type	data	Description
1	positioning mode	A	A = Automatic selection, M = Manual selection
2	Location type	3	Fix type 1 = Fix not available 2 = 2D 3 = 3D
3	Satellite used	23,31,12,195,199…	The currently in-use satellite PRN code number
4	PDOP	0.98	Position dilution of precision (0.0 to 99.9)
5	HDOP	0.62	Horizontal dilution of precision (0.0 to 99.9)
6	VDOP	0.76	Vertical dilution of precision (0.0 to 99.9)
7	GNSS System ID	1~4	1 for GPS, 2 for GLONASS, 3 for GALILEO, 4 for BDS
8	Checksum	39	

12-4 GSV – GNSS satellites in view

Number of satellites (SV) in view, satellite ID numbers, elevation, azimuth, and SNR value. Four satellites maximum per transmission.

statement structure:

$GPGSV, x, x, xx, xx, xx, xx, xx, …, xx, xx, xx, xx, xx, x*hh

For example:

$GPGSV,4,1,14,41,46,237,38,23,44,154,41,31,27,252,38,12,23,048,43,1*6A

$GLGSV,2,1,07,77,79,025,41,65,19,114,33,82,04,264,25,76,30,028,29,1*75

$GAGSV,3,1,09,02,40,178,43,25,58,093,48,03,50,356,37,05,35,069,38,7*7E

$GBGSV,5,1,20,23,83,254,50,39,58,347,42,38,57,175,46,09,56,287,43,1*75

Table 12-4-1: GSV Statement Parsing

Field	type	data	Description
1	Number of message	4	The total number of GSV statements this time
2	Sequence number	1	This GSV statement is the statement of this GSV series.
3	Satellites in view	14	Total number of satellites in view
4	Satellite ID	41	The currently in-use satellite PRN code number
5	Satellite Elevation	46	Satellite elevation in degrees, (00 ~ 90)
6	Satellite Azimuth	237	Satellite azimuth angle in degrees, (000 ~ 359)
7	SNR	38	SNR(Signal to Noise Ratio)
8	Signal ID	1	1 for L1/CA, 4 /7for L5/CA
9	Checksum	6A	

12-5 RMC – Recommended format for positioning information data

Time, date, position, course and speed data provided by a GNSS navigation receiver.

statement structure:

$GNRMC,hhmmss.sss,A,dddmm.mmmm,a,dddmm.mmmm,a,x.x,x.x,ddmmyy,,,a*hh

For example:

$GNRMC,073650.000,A,2235.3640,N,11351.6143,E,0.01,0.00,180924,,,D,V*0F

Table 12-5-1: RMC Statement Parsing

Field	type	data	Description
1	UTC time	073650.000	The total number of GSV statements this time
2	Status	A	This GSV statement is the statement of this GSV series.
3	Latitude	2235.3640	ddmm.mmmm（If the leading digits are insufficient, add zeros.）
4	N/S Indicator	N	Latitude hemisphere indicator, 'N' = North, 'S' = South
5	Longitude	11351.6143	ddmm.mmmm（If the leading digits are insufficient, add zeros.）
6	E/W Indicator	E	Longitude hemisphere indicator, 'E' = East, 'W' = West
7	Speed over ground	0.01	Speed over ground in knots (000.0 ~ 999.9)
8	Course over ground	0.00	Course over ground in degrees (000.0 ~ 359.9)
9	UTC Date	180924	UTC date of position fix, ddmmyy format
10	Mode Indicator	D	Mode indicator 'N' = Data not valid 'A' = Autonomous mode 'D' = Differential mode 'E' = Estimated (dead reckoning) mode
11	checksum	0F	

12-6 VTG – Course Over Ground and Ground Speed

The actual course and speed relative to the ground.

statement structure:

$GNVTG,x.x,T,,M,x.x,N,x.x,K,a*hh

For example:

$GNVTG,0.00,T,,M,0.01,N,0.01,K,D*26

Table 12-6-1: VTG Statement Parsing

Field	type	data	Description
1	Course	0.00	True course over ground in degrees (000.0 ~ 359.9)
2	T		True North Reference System
3	M		Magnetic North Reference System
4	Speed	0.01	Speed over ground in knots (000.0 ~ 999.9)
5	N		Knots
6	Speed	0.01	Speed over ground in kilometers per hour (000.0 ~ 1800.0)
7	K		kilometers per hour
8	Mode Indicator	D	Mode indicator 'N' = Data not valid 'A' = Autonomous mode 'D' = Differential mode 'E' = Estimated (dead reckoning) mode
9	checksum	26	

12-7 ZDA – Time and Date

UTC, day, month, year and local time zone.

statement structure:

$GNZDA,hhmmss.sss,xx,xx,xxxx,xx,xx*hh

For example:

$GNZDA,073650.000,18,09,2024,,*4B

Table 12-7-1: GSV Statement Parsing

Field	type	data	Description
1	UTC time	073650.000	UTC time in hhmmss.ss format (000000.00 ~ 235959.99)
2	UTC Day	18	UTC time: day (01 ~ 31)
3	UTC Month	19	UTC time: month (01 ~ 12)
4	UTC Year	2024	UTC time: year (4 digit format)
5	Checksum	38	

13 PRODUCT PACKAGING INFORMATION

13.1 Default Packing

a, Tray vacuum

b, Tray Dimension: 230mm * 150mm

Figure 13-1-1: Vacuum Tray

13.2 Packing box (Optional)

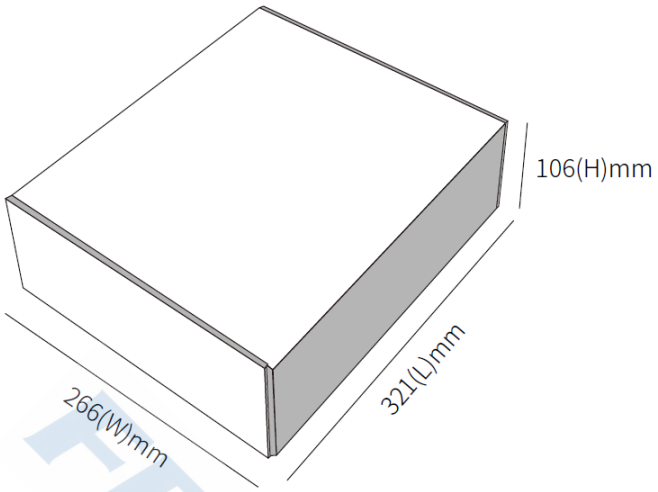


Figure 13-2-1: Packing box(Optional)

** If any packaging other than the package mentioned above is required, please confirm the packaging size again.*

** Packing: 1000pcs per carton (Minimum packing quantity).*

** The outer packing size provided above is for reference purposes only. For the actual dimensions of the product's packaging, please refer to the packaging of the actual goods.*

14 APPLICATION SCHEMATIC