

# GLOBALSAT GPS Engine Board

Hardware Data Sheet

Product No : MT-5631G

Version 0.1



Globalsat Technology Corporation

16F., No. 186, Jian-Yi Road, Chung-Ho City, Taipei

Hsien 235, Taiwan

Tel: 886-2-8226-3799 Fax: 886-2-8226-3899

E-mail : [service@globalsat.com.tw](mailto:service@globalsat.com.tw)

Website: [www.globalsat.com.tw](http://www.globalsat.com.tw)

Issue Date	APPR	CHECK	PREPARE
2012/11/30			Luwalk Lee

# Product Description

---

## Product Description

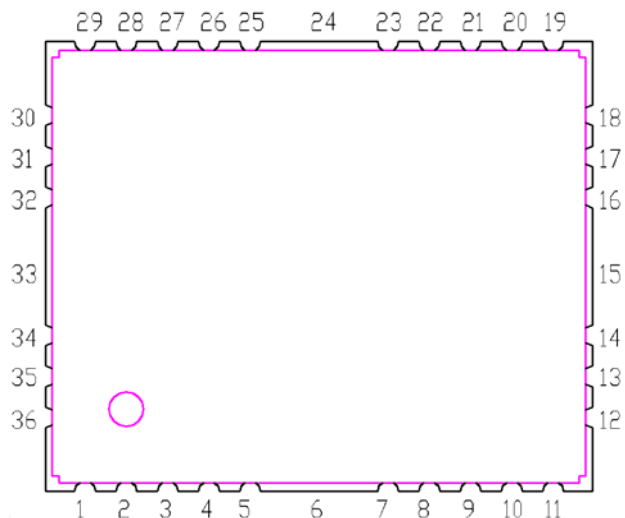
MT-5631G is a compact, high performance, and low power consumption GPS+GLONASS engine board. This GPS module is powered by MediaTek, it can provide you with superior sensitivity and performance even in urban canyon and dense foliage environment. The miniature size makes the module easy and the best choice to integrate into portable device like mobile phone, PDAs, camera and vehicle locators. Automotive navigation

- Personal positioning
- Fleet management
- Mobile phone navigation
- Marine navigation

## Product Features

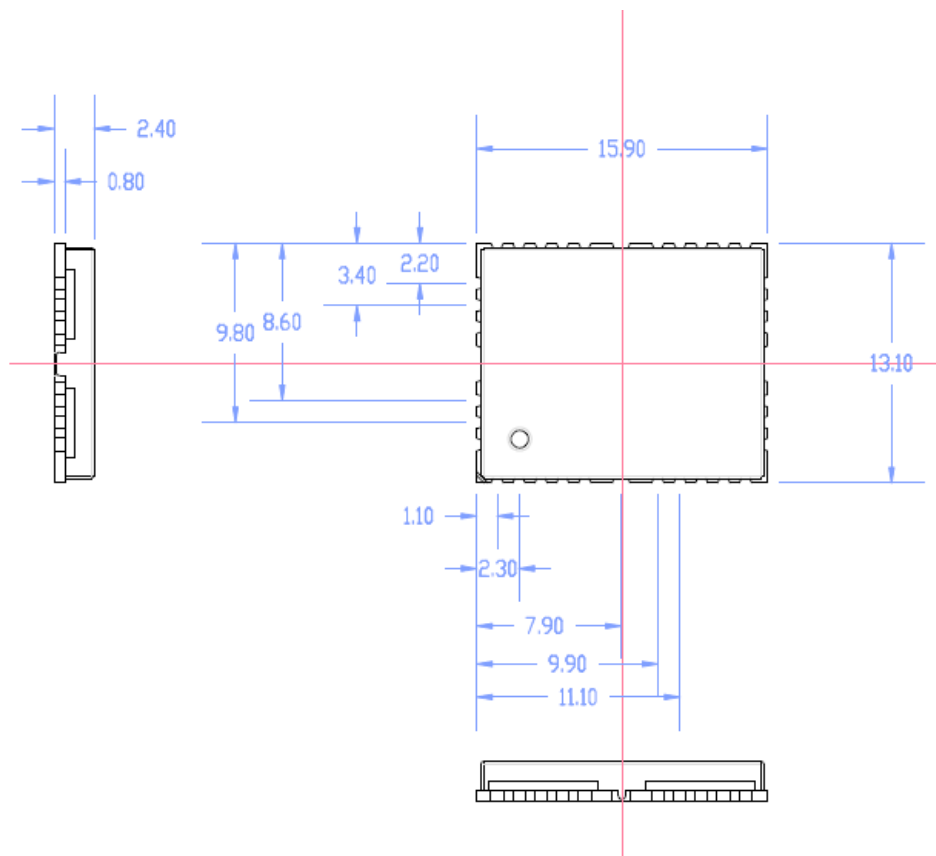
- MediaTek high sensitivity solution
- Support 66-channel GPS
- Very high sensitivity (Tracking Sensitivity: -164 dBm)
- Extremely fast TTFF (Time To First Fix) at low signal level
- Support USB and Serial port NMEA output
- Built-in LNA
- Compact size (15.9mm \* 13.1mm \* 2.4mm) suitable for space-sensitive application
- One size component, easy to mount on another PCB board
- Support NMEA 0183 V3.0 (Output: GGA, GSA, GSV, RMC, VTG, GLL, ZDA)

## Product Pin Description



PIN Number(s)	Name	Type	Description	Note
1	RF IN	RF	GPS antenna input	
2,3,4,6,8,9,10,12 14,15,17,19,21, 22,23,24,26,28, 29,33,35,36	GND	P	Ground.	
5	VBAT	P	This is the battery backup power input for the SRAM and RTC when main power is removed.	
7,32,34,16,25	NC		NC	
11	VCC	P	This is the main power supply to the engine board. (3.1Vdc to 3.5Vdc)	
13	RESET	I	MT-5631 reset pin. This input is low active.	
18	GPIO	I/O	User can use this I/O pin for special functions. (For example, control LED)	
20	TIMEMARK	O	One pulse per second output.(1PPS)	
27	WAKE_UP	I	MT-5631 hardware standby function, that is edge-trigger type, falling to enter standby mode, and raising to normal mode	
30	TXD	O	This is the main transmits channel for outputting navigation and measurement data to user's navigation software or user written software. Output TTL level.	
31	RXD	I	This is the main receive channel for receiving software commands to the engine board from user written software.	

## Package Dimensions



Unit: mm

Type	36-pin stamp holes
Dimensions	15.9 mm * 13.1 mm * 2.4mm ±0.2mm

## Electrical Specification

### Absolute Maximums Ratings

Parameter	Min.	Typ.	Max.	Conditions	Unit
<b>POWER Supply</b>					
Main power supply	3.1	3.3	3.5		V
Backup battery supply	2.0		3.5		V
Main power supply Current		25			mA
Backup battery supply Current	4.5	5	5.5		uA
<b>Interface (VCC = 3.3V, VBAT= 3.3V, Operation Temp.= 25°C)</b>					
High Level input Voltage	0.7*VDD		3.5		V
Low Level input Voltage	-0.3		0.3*VDD		V
High Level input Current	-10		10 60	(V=2.85V) (with Pull Low)	uA
Low Level input Current	-10		10 -60	(V=0V) (with Pull High)	uA
High Level output Voltage	0.75*VDD				V
Low Level output Voltage			0.25*VDD		V
<b>RF Input</b>					
Input Impedance		50			Ω
Operating Frequency		1.575			Ghz

☆ VDD is 2.85V for MTK CHIP

### Environmental Characteristics

Parameter	Min	Typ	Max	Unit
Humidity Range	5		95	% non-condensing
Operation Temperature	-40	25	85	°C
Storage Temperature	-40		85	°C

Receiver Performance

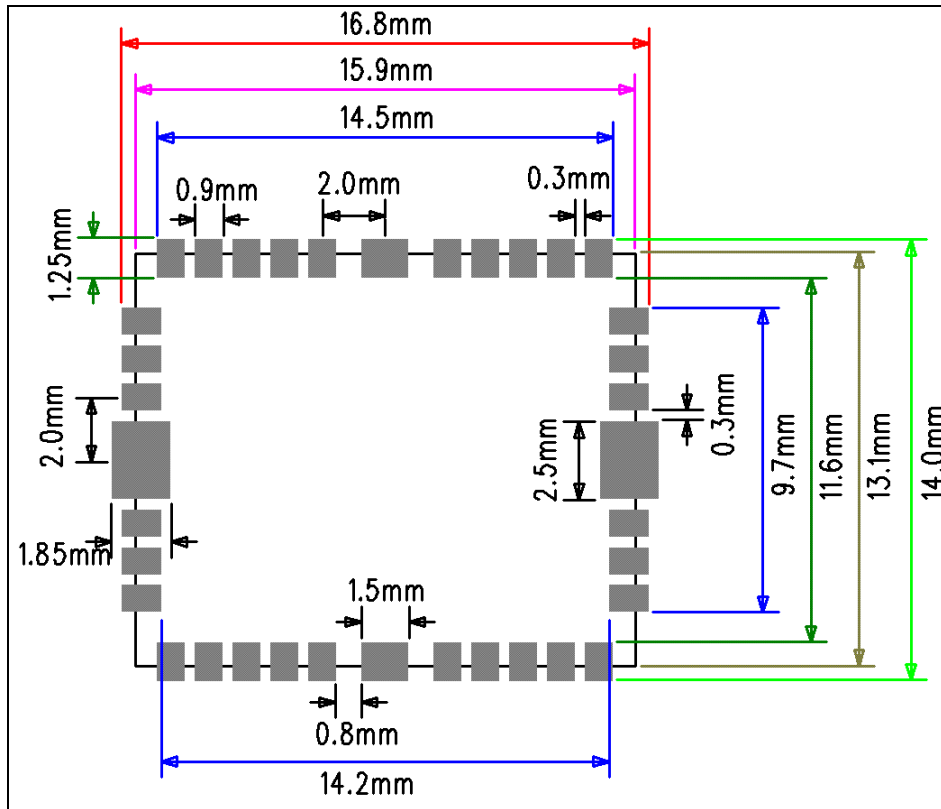
Sensitivity <sup>1</sup>	Tracking :	-164dBm
	Autonomous acquisition :	-147 dBm
Time-To-First-Fix <sup>2</sup>	Cold Start – Autonomous	< 35s
	Warm Start – Autonomous	< 35s
	Hot Start – Autonomous	< 1s
Horizontal Position accuracy <sup>3</sup>	Autonomous	< 3m (2D RMS)
	SBAS	< 2.0m
Velocity Accuracy <sup>4</sup>	Speed	< 0.01 m/s
	Heading	< 0.01 degrees
Reacquisition	0.1 second, average	
Max Update Rate	5 Hz	
Maximum Altitude	< 18,000 meter	
Maximum Velocity	< 515 meter/ second	
Maximum Acceleration	< 4G	

<Note>

1. -142 dBm  $\approx$  28dB-Hz with 4 dB noise figure
2. 50% -130dBm Fu 0.5ppm Tu  $\pm$ 2s Pu 30Km
3. 50% 24hr static, -130dBm
4. 50% @ 30m/s

# PCB Layout Recommend

## Recommended Layout PAD



Unit: mm

Tolerance: 0.1mm

### PCB Layout Recommendations

Do not routing the other signal or power trace under the engine board.

#### RF:

This pin receives signal of GPS analog via external active antenna .It has to be a controlled impedance trace at 50ohm.

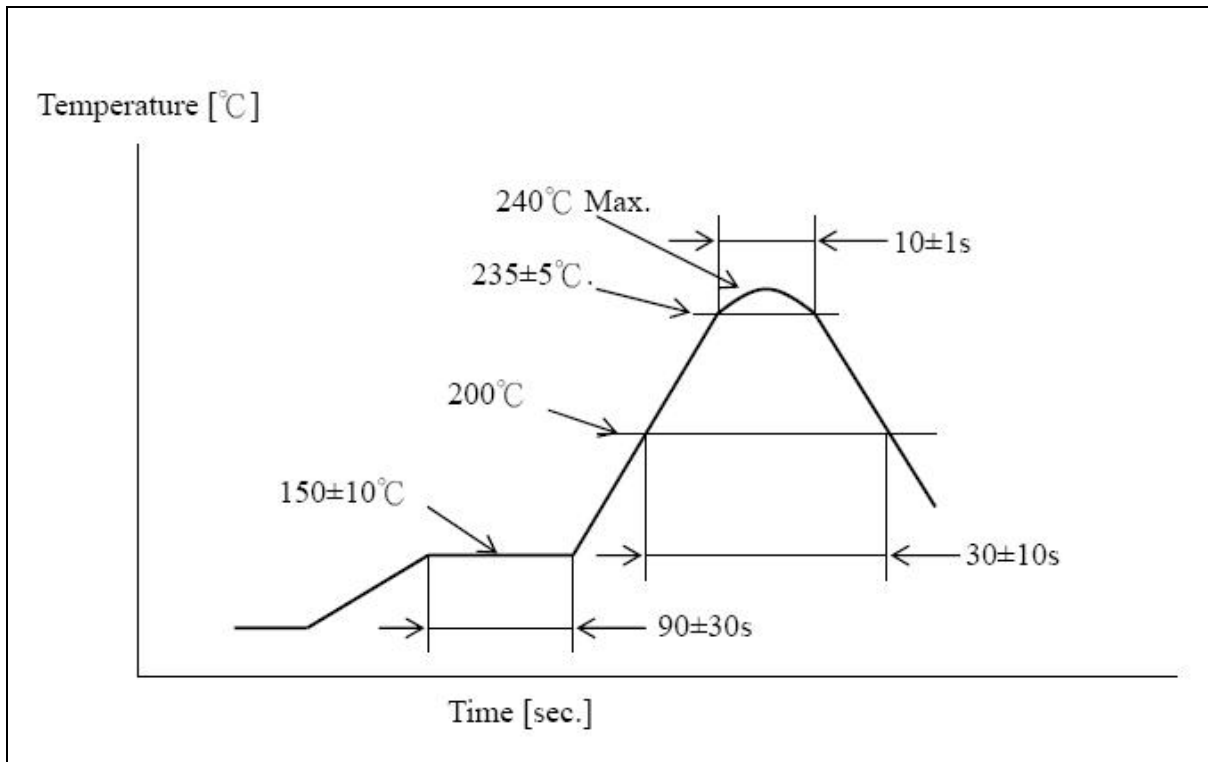
Do not place the RF traces close to the other signal path and not routing it on the top layer.

Keep the RF traces as short as possible.

#### Antenna:

Keep the active antenna on the top of your system and confirm the antenna radiation pattern 、 axial ratio 、 power gain 、 noise figure 、 VSWR are correct when you Setup the antenna in your case.

## Recommended Reflow Profile:



Pre heating temperature: 150±10[°C]      Pre heating time: 90±30[sec.]

Heating temperature: 235±5[°C]      Heating time: 10±1[sec.]

Peak temperature must not exceed 240°C and the duration of over 200°C should be 30±10 Seconds.