

GLOBALSAT GPS Engine Board

Hardware Data Sheet

Product No : MT-5531

Version 0.1



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Product Description

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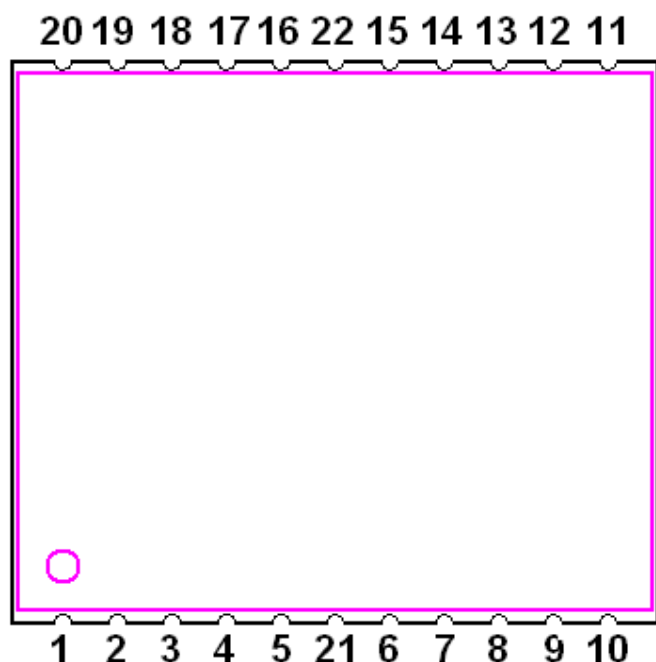
MT-5531 is a compact, high performance, and low power consumption GPS engine board. This GPS module is powered by MediaTek, it can provide you with superior sensitivity and performance even in urban canyon and dense foliage environment. The miniature size makes the module easy and the best choice to 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

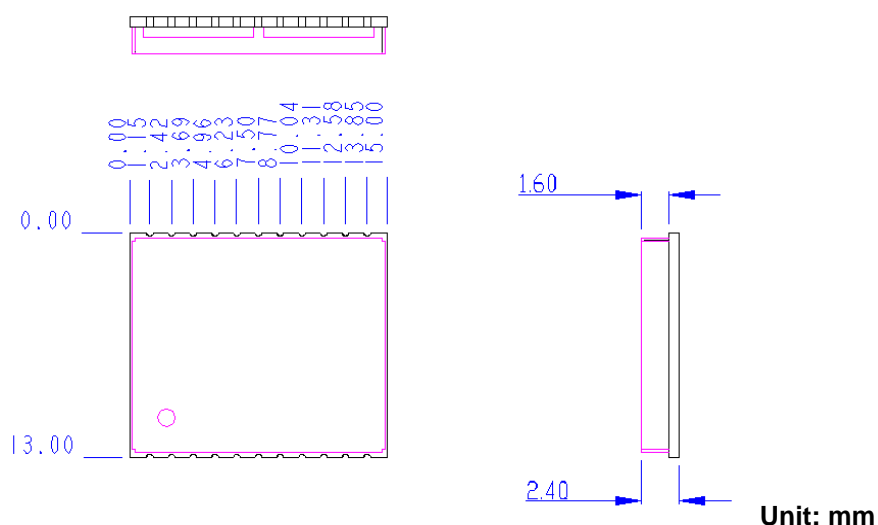
- MediaTek high sensitivity solution
- Support 66-channel GPS
- Very high sensitivity (Tracking Sensitivity: -164 dBm)
- Extremely fast TTFF (Time To First Fix) at low signal level
- Support USB and Serial port NMEA output
- Built-in LNA
- Compact size (15.0mm * 13.0 mm * 2.4mm) suitable for space-sensitive 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,	RXB	I	Serial input (default null)	
2	TXB	O	Serial output (default null)	
3	TIMEPULSE	O	One pulse per second output.(1PPS)	
4	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, 0V ~ 2.85V.	
5	RxD	I	This is the main receive channel for receiving software commands to the engine board user written software.	
6, 9,10,16	NC			
7	GPIO_6	I/O	LED Output	
8	MR	I	MT-5531 Reset input.	
11	V_BAT	P	Backup battery supply voltage	
12	VCC	P	Main power supply to the engine board.	
13	GPIO_8	I/O	General purpose I/O	
14	GPIO_9	I/O	General purpose I/O	
15	GPIO_10	I/O	General purpose I/O	
17	VCC_RF	O	Supply Antenna Bias voltage (V=VCC)	
18,20,21,22	GND	P	Ground.	
19	RF IN	RF	GPS antenna input	

Package Dimensions



Type	22-pin stamp holes
Dimensions	15.0mm X 13.0mm X 2.4mm (±0.2mm)

Electrical Specification

Absolute Maximums Ratings

Parameter	Min.	Typ.	Max.	Conditions	Unit
POWER Supply					
Main power supply	3.1	3.3	3.5		V
Backup battery supply	2.0		3.5		V
Main power supply Current		23			mA
Backup battery supply Current	4.5	5	5.5		uA
Interface (VCC = 3.3V, VBAT= 3.3V, Operation Temp.= 25°C)					
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
RF Input					
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

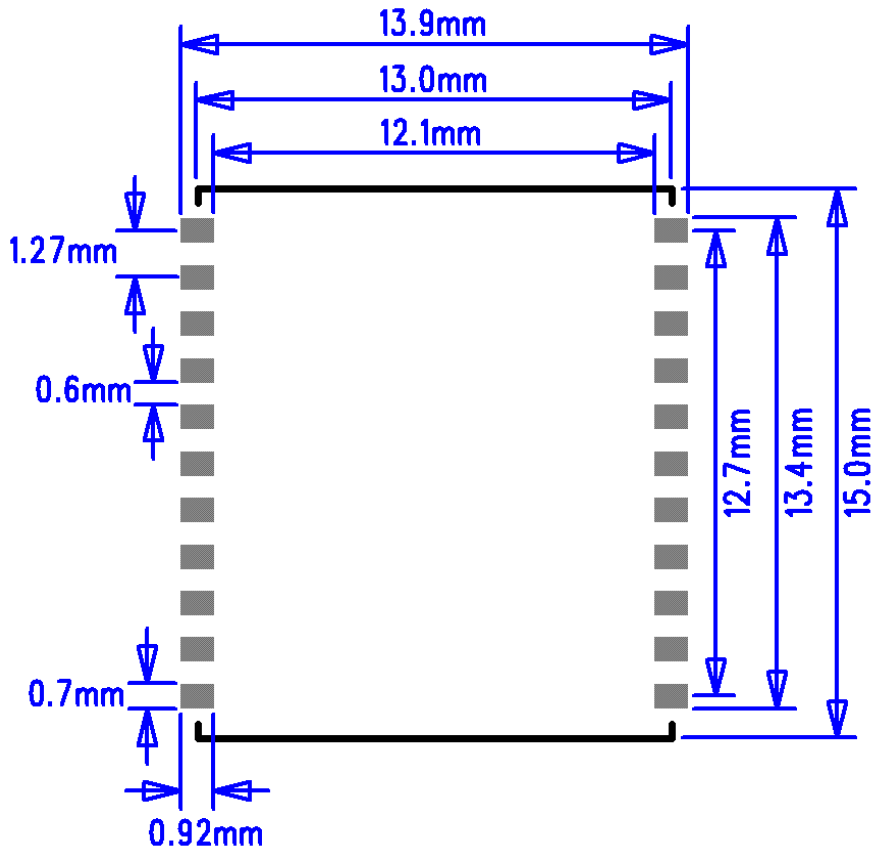
Sensitivity	Tracking : -164dBm Autonomous acquisition : -147 dBm
Time-To-First-Fix	Cold Start – Autonomous < 35s Warm Start – Autonomous < 35s Hot Start – Autonomous < 1s
Horizontal Position accuracy	Autonomous < 3m (2D RMS) SBAS < 2.0m
Velocity Accuracy	Speed < 0.01 m/s Heading < 0.01 degrees
Reacquisition	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.

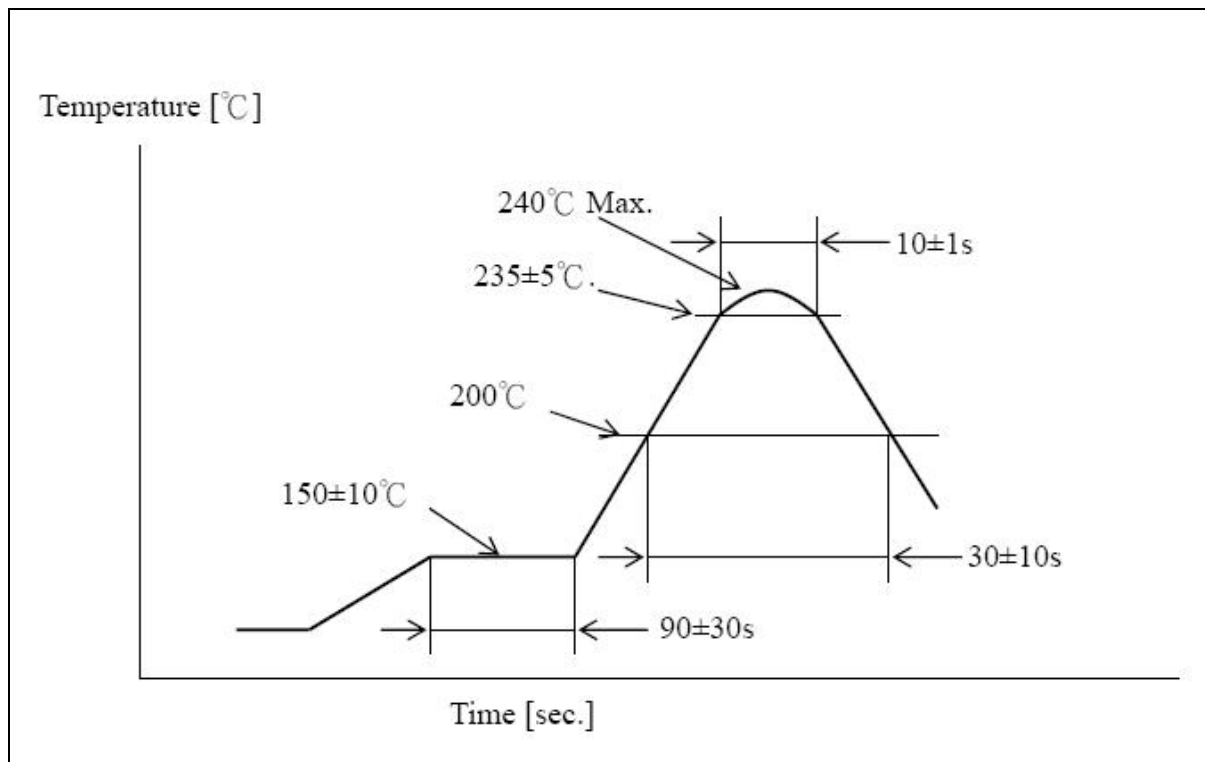
Do not place the RF traces close to the other signal path and not routing it on the top layer.

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.