GLOBALSAT GPS Engine Board

Hardware Datasheet

Product No : MR-332(SMA)

Version 1.0

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Issue Date	APPR	CHECK	PREPARE
2013/07/03	Ray		Mason

Product Description

Product Description

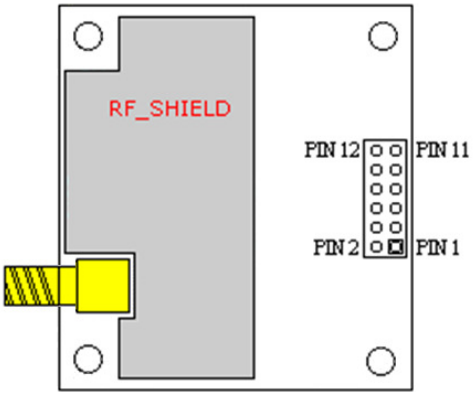
MR-332 is a compact, high performance, and low power consumption GPS engine board. The chipset is powered by MediaTek, it can provide you with superior sensitivity and performance even in urban canyon and dense foliage environment. MR-332 is suitable for the following applications:

- Automotive navigation
- Personal positioning
- Fleet management
- Marine navigation

Product Features

- MediaTek high sensitivity solution
- Support 22 tracking / 66 acquisition-channel GPS receiver
- Very high sensitivity (Tracking Sensitivity: -165dBm)
- Extremely fast TTFF (Time To First Fix) at low signal level
- Support RS-232 interface, baud rate base on firmware setting.
- Support Serial port NMEA output.
- Built-in LNA
- Compact size (40.6mm x 35.0mm x 13.7mm) suitable for space-sensitive application
- Support NMEA 0183 V3.01 (GGA, GSA, GSV, RMC)
- Supports GPS, SBAS ranging (WASS/EGNOS/MSAS/GAGAN), QZSS.

Product Pin Description



PIN Number(s)	Name	Type	Description	Note
1,8,9,12	GND	P	Ground	
2	VBAT	P	This is the power input for the SRAM, RTC and charging back up battery. To achieve the faster start-up offered by a hot or warm start, a backup power must be connected. When VBAT released, the full battery can keep the SRAM and RTC few hours. The VBAT voltage should be between 3.3V and 3.6V. When VCC is connected to the Power, VBAT can be floating.	
3	VCC	P	This is the main power supply to the engine board. (3.8Vdc to 5.5Vdc)	
4	RESET	I	Push Button Reset Input (Active Low)	
5,10	RESERVED		MR-332 reserved pin, just NC.	
6	TXD	O	This is the main transmits channel for outputting navigation and measurement data to user's navigation software or user written software. Baud rate based on firmware setting.	
7	RXD	I	This is the main receive channel for receiving software commands to the engine board from MTK software or from user written software. Baud rate based on firmware setting.	
11	TIMEPULSE	O	This pin provides one pulse-per-second output from the board, which is synchronized to GPS time. If do not use it, Just NC.	

Electrical Specification

Absolute Maximums Ratings

Parameter	Min.	Typ.	Max.	Conditions	Unit
Power					
Power supply voltage(VCC)	3.8	5.0	5.5		V
Backup battery supply	3.3		3.6		V
Main power supply Current		25		5V	mA
Backup battery supply Current	4.5	5	5.5	3.3V	uA
SMA Connector					
Input Impedance		50			Ω
Operating Frequency		1.575			GHz
RF Output Power		3.3			V

DC Electrical characteristics

Parameter	Symbol	Min.	Typ.	Max.	Conditions	Units
I/O Low Level Output Voltage	V_{OL}			0.42		V
I/O High Level Output Voltage	V_{OH}	2.38				V
I/O Low Level Input Voltage	V_{IL}	-0.3		0.7		V
I/O High Level Input Voltage	V_{IH}	2.1		3.6		V

RS-232 Receiver/Transmitter characteristics

Parameter	Min.	Typ.	Max.	Conditions	Units
EIA-232 Input Voltage Range	-30		+30		V
EIA-232 Input Threshold Low	0.6	1.2			V
EIA-232 Input Threshold High		1.6	2.4		V
Output Voltage Swing	±5.0	±5.2			V

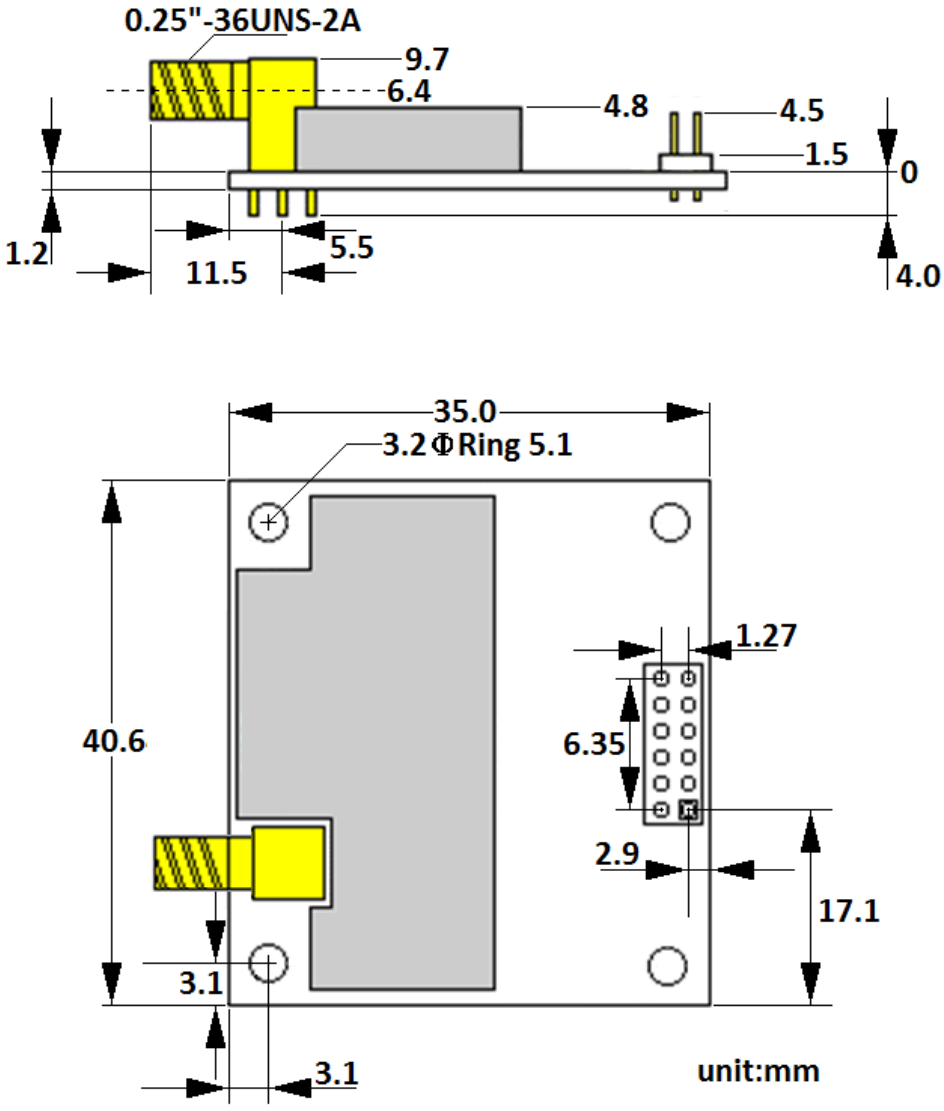
Environmental Characteristics

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

Receiver Performance

Sensitivity (Chipset)	Tracking : Acquisition (cold / hot) :	-165dBm -148dBm / -163dBm
Time-To-First-Fix	Cold Start – Autonomous Warm Start – Autonomous Hot Start – Autonomous	< 35s < 35s < 1s
Horizontal Position Accuracy	Autonomous SBAS	< 3m (2D RMS) <2.0m
Velocity Accuracy	Speed Heading	< 0.01 m/s < 0.01 degrees
Reacquisition	0.1 second, average	
NMEA Update Rate	Output data format based on firmware setting	
Maximum Altitude	< 18,000 meter	
Maximum Velocity	< 515 meter/ second	
Maximum Acceleration	< 4G	

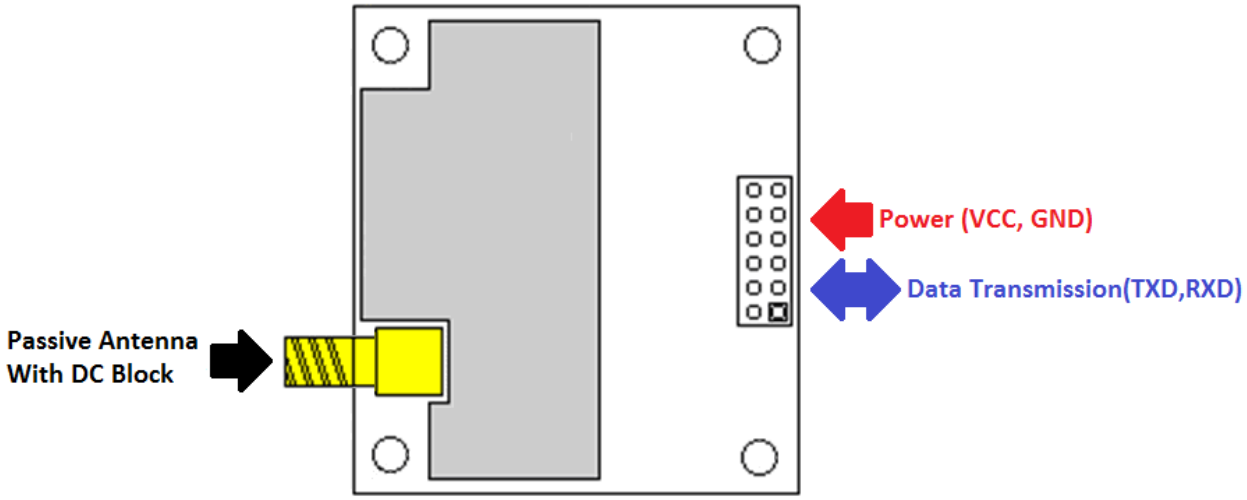
Package Dimensions



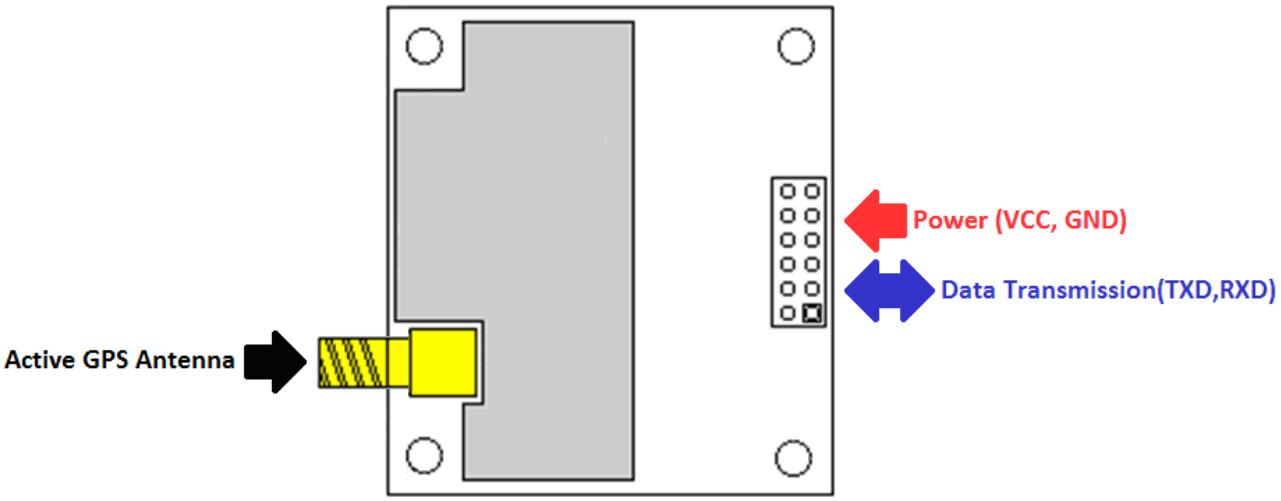
Type	**12-pin header male**
Dimensions	**40.6 mm * 35.0 mm * 13.7 mm ±0.2mm**

Application

Application circuit with passive antenna



Application circuit with active antenna



Recommended Active Antenna

GPS Active Antenna Specifications (Recommendation)

Frequency:	1575.42 + 2MHz	Amplifier Gain:	18~22dB Typical
Axial Ratio:	3 dB Typical	Output VSWR:	2.0 Max.
Output Impedance:	50Ω	Noise Figure:	2.0 dB Max
Polarization:	RHCP	Antenna Input Voltage:	2.85V (Typ.)

Reversion history

Reversion	Date	Name	Status / Comments
V1.0	2013/7/3	Mason	Initial Version