

GPS Engine Board



EB-54X

EB-54X is a complete GPS sub-system with 32 x 32 mm² In size. Equipped with antenna, back up battery GPS engine and onboard memory, it provides superior navigation performance under dynamic conditions in areas with limited sky view like urban canyons. High sensitivity up to **-165dBm** for weak signal operation without compromising accuracy. EB-54X is your best choice for embedded applications.



Key Features :

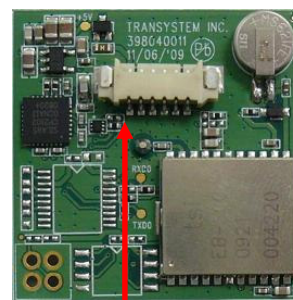
- Compact form factor: 32 x 32 x 11 mm
- Lead-Free – RoHS/WEEE compliant
- Tracks 66-Channel of satellites
- Fast Position Fix
- Low power consumption
- 5Vdc supply voltage
- USB / UART / TTL interface
- LED indication for GPS status
- Build-in re-chargeable backup battery
- Motion sensor & Log capability (EB-541 only)

Applications :

- Automotive and Marine Navigation
- Automotive Navigator Tracking
- Emergency Locator
- Geographic Surveying
- Personal Positioning
- Sporting and Recreation

Pin Assignment

Pin #	Signal Level		
	USB	RS-232	TTL
1	Vcc	Vcc	Vcc
2	D-	Vcc	RX
3	D+	RX	TX
4	GND	GND	GND
5	D-	TX	RX
6	GND	GND	1PPS



Pin #1

Model No.	Log Capability	Antenna	Signal Level	Connector
EB-540 UW	No	25x25x4 mm	USB	Wafer
EB-541 UW	Yes	25x25x4 mm	USB	Wafer
EB-540 RW	No	25x25x4 mm	RS-232	Wafer
EB-541 RW	Yes	25x25x4 mm	RS-232	Wafer
EB-540 TW	No	25x25x4 mm	Low Voltage TTL	Wafer
EB-541 TW	Yes	25x25x4 mm	Low Voltage TTL	Wafer

EB-54X-AB

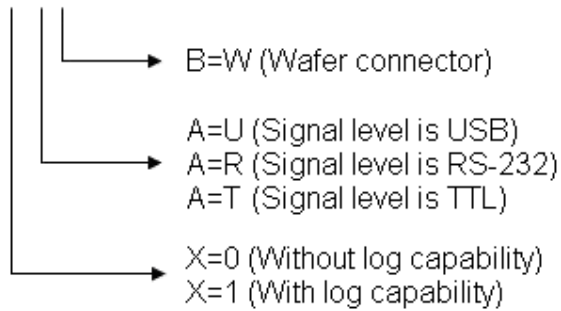


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1 Introduction

EB-54X series is an ultra miniature 32 x 32mm² GPS engine board. It provides superior navigation performance under dynamic conditions in areas with limited sky view like urban canyons. High sensitivity up to -165dBm for weak signal operation without compromising accuracy. EB-54X series is your best choice for embedded applications.

1.1 Key Features

- Compact form factor: 32 x 32 x 11 mm
- Lead-Free – RoHS/WEEE compliant
- Tracks 66-Channel of satellites
- Fast Position Fix
- Low power consumption
- 5Vdc supply voltage
- USB / UART / TTL interface
- LED indication for GPS status
- Build-in re-chargeable backup battery
- Motion sensor & Log capability (EB-541 only)

1.2 Applications

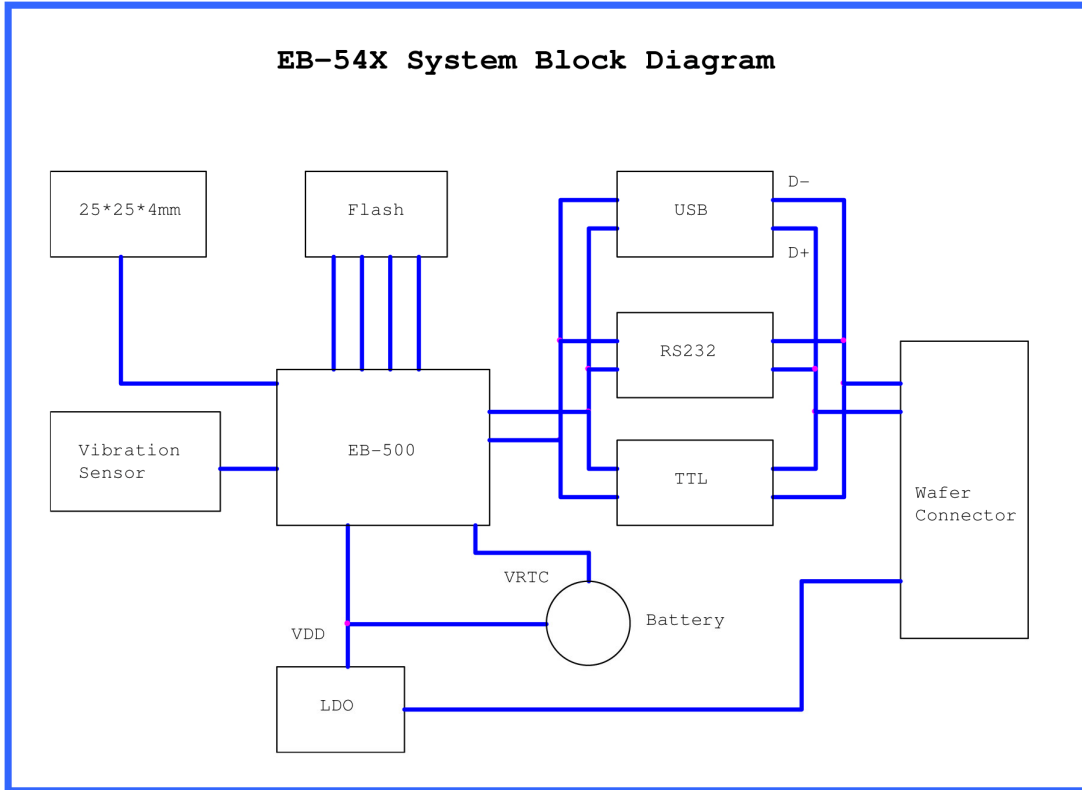
- Automotive and Marine Navigation
- Automotive Navigator Tracking
- Emergency Locator
- Geographic Surveying
- Personal Positioning
- Sporting and Recreation

1.3 Look & Feel



2 Technical Description

2.1 Block Diagram



2.2 Pin Definition

USB version

Pin#	Signal Name	Type	Description
1	VCC	P	VCC
2	D-	I	Signal input
3	D+	O	Signal output
4	GND	P	Ground
5	D-	I	Signal input
6	GND	P	Ground

RS232 version

Pin#	Signal Name	Type	Description
1	VCC	P	VCC
2	VCC	P	VCC
3	RX	I	RS-232 RX
4	GND	P	Ground
5	TX	O	RS-232 TX
6	GND	P	Ground

TTL version

Pin#	Signal Name	Type	Description
1	VCC	P	VCC
2	RX	I	GPS RX
3	TX	O	GPS TX
4	GND	P	Ground
5	RX	I	GPS RX
6	1PPS	O	GPS 1PPS signal

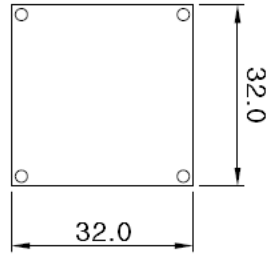
P: Power I: Input O: Output

2.3 Specification

<i>Specification</i>	<i>Description</i>
General	L1 frequency, C/A code (SPS) 66 independent tracking channels
Sensitivity	-165dBm /Tracking
Update Rate	Up to 5Hz
Accuracy	Without aid: 3.0m 2D-RMS DGPS (WAAS, EGNOS, MSAS, RTCM): 2.5m
Acquisition (open sky)	Cold Start: 35sec Warm Start: 34sec Hot Start: 1.5sec
Reacquisition	< 1sec
Dynamics	Altitude: 18000m (max.) Velocity: 515m/sec (max.) Vibration: 4G (max.)
Supply Voltage	DC 5V
Power Consumption	40mA max. @ 5.0V / Tracking
Backup Battery	Build-in
NMEA Message	NMEA0183 v3.1 baud rate 4800/9600/.../57600, default 9600 Selectable Output: GGA, GLL, GSA, GSV, RMC, and VTG
Datum	Default WGS-84
Antenna	Build-in 25*25*4 mm patch antenna, right hand circular polarization, 50ohm
Signal Level	USB, RS-232 or Low Voltage TTL
Connector	Wafer connector, pitch 1.25mm directional wire to board connector. See ordering information
Operating Temperature	-30°C to 85°C
Storage Temperature	-40°C to 85°C
Operating Humidity	≤ 95%, non condensing
Dimension	32 x 32 x 11 mm

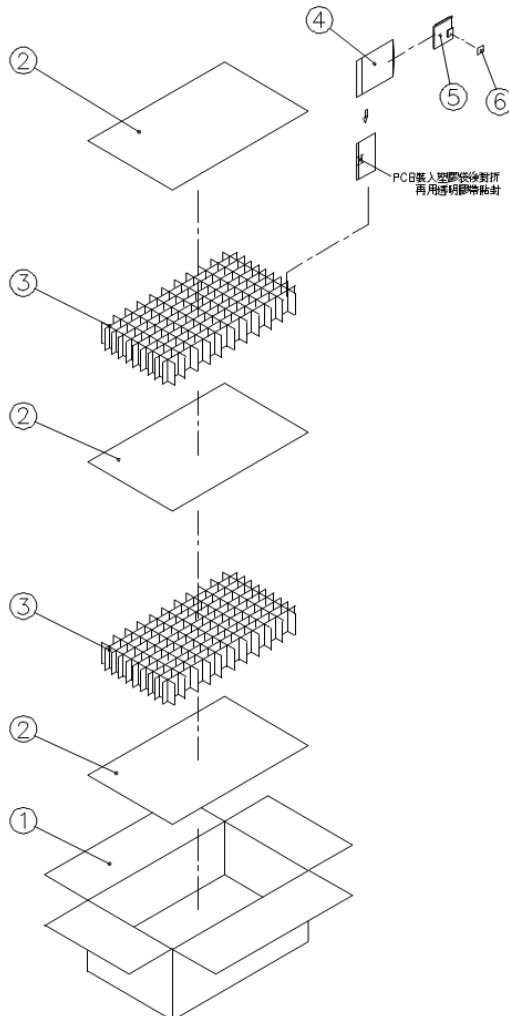
3 Dimension and Package

3.1 Mechanical Dimension



3.2 Package

6	8-01-96150-01	EB-54X Model label	1	
5	1-07-9615X-XX	EB-54X PCB Assy.	1	
4	8-04-22020-05	PE Bag (抗潮電阻膠袋)	1	
3	8-07-95100-02	Partition	2/200	
2	8-07-95100-01	Plate	3/200	
1	8-05-95100-01	Carton	1/200	
ITEM	P / N	DESCRIPTION	Q'TY	REMARK



4 Other Information

4.1 General GPS Receiver User's Tips

- If the satellite signals can not be locked or experiencing receiving problem (while in urban area), following steps are suggested:
 - a) Please plug the external active antenna into GPS receiver and put the antenna outdoor or on the roof of the vehicle for better receiving performance.
 - b) Move to another open space or reposition GPS receiver toward the direction with least blockage.
 - c) Move the GPS receiver away from the interference sources.
 - d) Wait until the weather condition is improved.
- Some vehicles having heavy metallic sun protecting coating on windshields may affect signal receptions
- Driving in and around high buildings may affect signal reception.
- Driving under tunnels or in buildings may affect signal reception.
- In general, GPS receiver performs best in open space where it can see clean sky. Weather will affect GPS reception – rain & snow contribute to worsen sensitivity.
- When GPS receiver is moving, it will take longer time to get position fix. Wait for satellite signals to be locked at a fixed point when first power-on the GPS receiver to ensure quick GPS position fix.

4.2 How to avoid ESD damage to ICs

- Any person handling the ICs should be grounded either with a wrist strap or ESD-protective footwear used in conjunction with a conductive or static-dissipative floor or floor mat.
- The work surface where devices are placed for handling, processing, testing, etc., must, be made of static-dissipative material and be grounded to ESD ground.
- All insulator materials must either be removed from the work area or must be neutralized with an ionizer. Static-generating clothing must be covered with an ESD-protective smock.
- When ICs are being stored, transferred between operations or workstations, or shipped, they must be kept in a Faraday shield container with inside surfaces (surfaces touching the ICs) that are static-dissipative.

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