Doc Version

1.2

GlobalSat Technology Corporation

EM-411

GPS RECEIVER ENGINE BOARD

GLOBALSAT TECHNOLOGY CORPORATION

GPS Engine Board Specifications

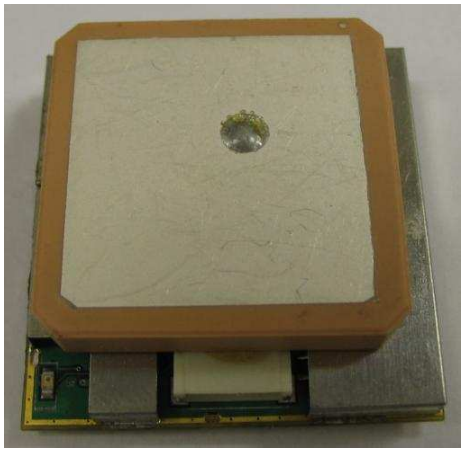
REVISIONS

V1.0	10-01-2006	Convert test to USG format
V1.1	10-23-2006	Update pin-out drawing
V1.2	10-05-2007	Corrected pin-out drawing

16F, No. 186 Jian Yi Road, Chung Ho City, Taipei, 235, Taiwan.
www.globalsat.com.tw

USGlobalSat, Inc. (USA)
1308 John Reed Court, City of Industry, CA 91745
http://www.usglobalsat.co

Table of Contents



EM-411 GPS BOARD OVERVIEW

The EM-411 GPS engine board is low cost but maintains high reliability and accuracy making it an ideal choice for integration with OEM/ODM systems. The EM-411 features an integrated patch antenna for complete implementation.

FEATURES:

1. SiRF Star III high performance GPS chipset
2. Very high sensitivity (Tracking Sensitivity: -159dBm)
3. Extremely fast TTFF (Time To First Fix) at low signal levels
4. Supports the NMEA 0183 data protocol
5. Built-in SuperCap to maintain system data for rapid satellite acquisition
6. Built-in patch antenna
7. Foliage Lock for weak signal tracking
8. Compact in size
9. All-in-view 20-channel parallel processing
10. Snap Lock 100ms re-acquisition time
11. Superior urban canyon performance
12. WAAS / EGNOS support
13. RoHS compliant

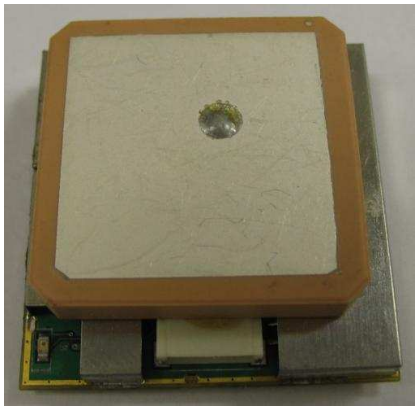
Only differences between the EM-411 and EM-406/406a Engine Boards:

EM-406:TX and RX pins are transposed.

EM-406 PIN #3=RX & PIN #4=TX (non-lead-free)
EM-411 PIN #3=TX & PIN #4=RX (RoHSl ead-free)

EM-406a:TX and RX pins are transposed.

EM-406a PIN #3=RX & PIN#4=TX (RoHS lead-free)
EM-406a has 1PPS output on header pin #6.
EM-411 PIN #3=TX & PIN#4= RX (RoHS lead-free)



SPECIFICATIONS

General - Receiver
Chipset: SiRF Star III
Frequency: L1, 1575.42 MHz
C/A Code: 1.023 MHz chip rate
Channels: 20 channel all-in-view tracking
Sensitivity: -159dBm

Accuracy
Position: 10 meters, 2D RMS
5 meters, 2D RMS, WAAS enabled
Velocity: 0.1 ms
Time: 1μs synchronized to GPS time

Datum
Default: WGS-84

Acquisition Time
Reacquisition: 0.1 sec., average
Hot Start: 8 sec., average
Warm Start: 38 sec., average
Cold Start: 42 sec., average

Dynamic Conditions
Altitude: 18,000 meters (60,000 feet) max
Velocity: 515 meters/second (1000 knots) max

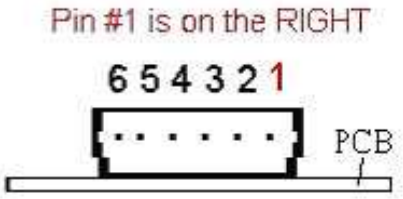
Power
Main Power Input: 4.5V~6.5V DC Input
Powwer Consumption: 60mA (35mA trickle mode)
Backup power: +2.5V to +3.6V
Bacckup current: 10uA typical

ProtProtocol
Electrical Level: TTL level,
Output Voltage Level: 0V~2.85V
Baud Rate: 4800 bps
OuOutput Message: NMEA 0183 GGA, GSA, GSV,
RRMC (VTG, GLL optional)

Physical Characteristics
Dimensions: 1.181" x 1.181" x 0.413"
(30mm x 30mm x 10.5mm)
Operating Temperature: -40F to +176F
(-40C to +85C)
Humidity: Up to 95% non-condensing

PIN ASSIGNMENT

1: GND
2: VCC
3: TX
4: RX
5: GND



PIN DESCRIPTIONS

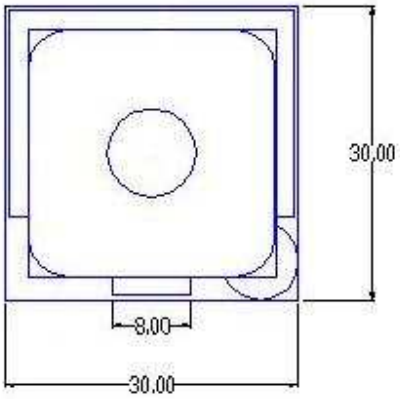
VCC: (DC power input): This is the main DC supply for a 4.5V ~ 6.5V power module board.

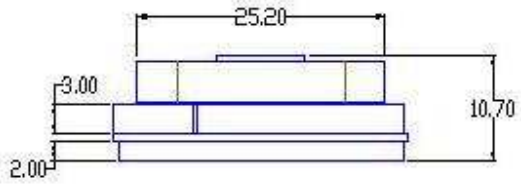
TX: This is the main transmit channel for outputting navigation and measurement data to user's navigation software or user-written software.

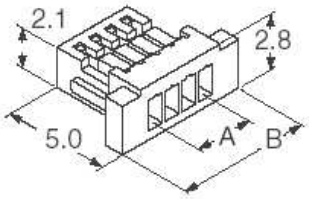
RX: This is the main receive channel for receiving software commands to the engine board from SiRfdemo software or from user-written software. Normally this pin must be kept High and if you don't use this pin please connect a resistor to 3.5V to pull it high.

GND: GND provides the ground for the engine boards. Be sure to connect all grounds

DIMENSIONS

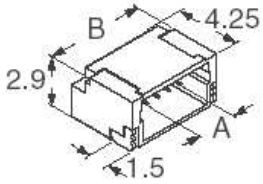






Female Cable Connector

Digi-Key Part No: 455-1381-ND



Male PCB Header

Digi-Key Part No: 455-1806-1-ND

MOUNTING

Recommended mounting methods:

a. Use industrial grade double-sided foam tape. Place it on the bottom side of the engine board.

b. A recessed cavity in your housing design with a foam pad to eliminate shifting or movement.

c. Use provided mounting holes on the GPS engine board PCB.

NMEA & SiRF COMMAND LINKS

Please download the latest output and control commands from our web-site:

NMEA Command Reference Manual
(http://www.usglobalsat.com/downloads/NMEA_commands.pdf)

SIRF Binary Protocol Reference Manual
(http://www.usglobalsat.com/downloads/SiRF_Binary_Protocol.pdf)

All product specifications contained in this document are subject to change without notice.

NOTES: