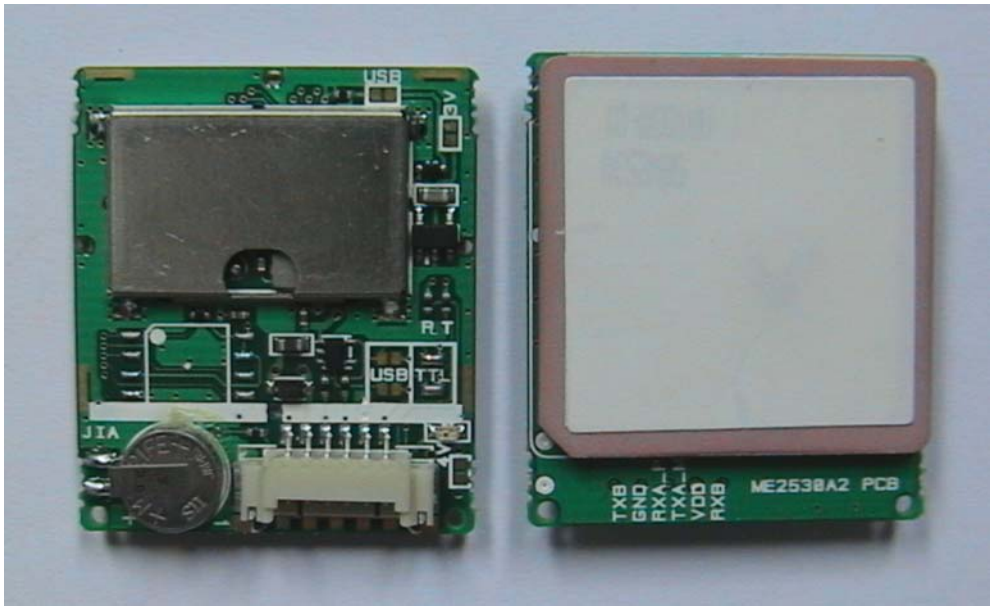
# ME2530A

GPS RECEIVER WITH ANTENNA

DATA SHEET



# Contents

## Revision history

| Revision No. | Revision DATE | Issue | Note |
|---|---|---|---|
| 1 | 27.July.2009 | Document Drawing | PCB : ME2530A2 |
| 2 | 04.AUG.2009 | Change<br>9. Active Antenna Selection Guide Recommend<br>→ Output option select point<br>Add<br>14. Position Data Log ( Buyer Order Option ) | PCB : ME2530A2 |
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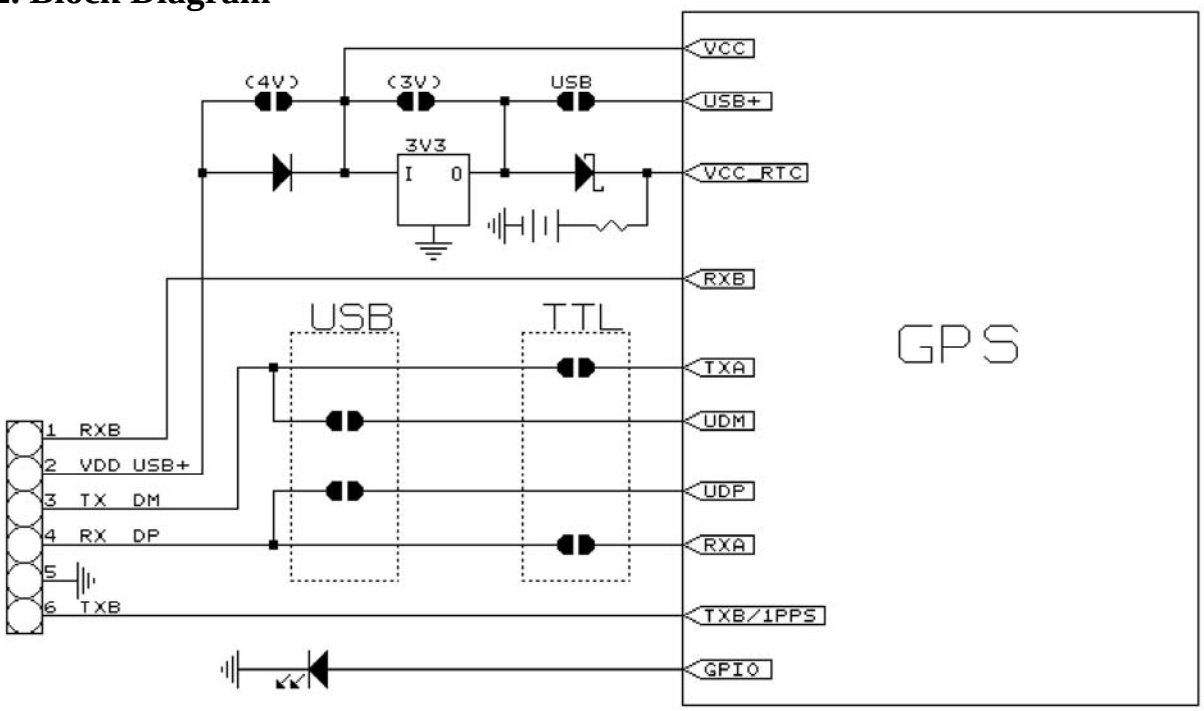
## 1. Functional Description

Full self-contained GPS receiver

Fully shielded design

- High Performance GPS Single Chip
  GPS DSP with integrated real time clock(RTC) ARM7EJ-S CPU
- 4Mbit FLASH memory
- Low noise amplifier
- SAW filter
- Built-in regulators (LDO)
- GPS receiver With Patch Antenna
- Patch Antenna Size : 25(L)mm X 25(W)mm X 2(T)mm
- Size : 30mm(L) X 25mm(W) X 7mm(T)
- Weight : 14 grams

## 2. Block Diagram




Operating supply voltage Hardware option select

4.5~5.2V： 4V:OPEN 3V:OPEN

3.4~4.5V： 4V:SHORT 3V:OPEN

3.2~3.4V： 4V:SHORT 3V:SHORT

## 3. Output Protocols

Data format : WGS-84 NMEA 0183

Activated message : GGA, GSA, GSV, RMC all with checksum enabled

Signal format : Buad rate:9600, Byte:8, Parity:none, stop bit:1

Up-date rate : 1 sec

## 4. Input Start Commands

| MESSAGE | COMMANDS |
|---|---|
| COLD START | $PSRF101,0,0,0,000,0,0,12,4*10 |
| WARM START | $PSRF101,0,0,0,000,0,0,12,2*16 |
| HOT START | $PSRF101,0,0,0,000,0,0,12,1*15 |

Time To First Fix (TTFF)

a) Cold Start 35sec (typical)

In a 'Cold Start' scenario, the receiver has no knowledge of position, time or the satellite constellation.

The receiver starts to search for signals blindly.

Cold start time is the longest startup for this module

b) Warm Start 34sec (typical)

In a 'Warm Start' scenario, due to a backup battery the receiver knows its last poison,

the approximate time and the constellation almanac.

Thanks to this it can quickly acquire satellites and gat a position fix faster then in 'Cold Start' mode.

c) Hot Start 1.5sec (typical)

In a 'Hot Start' scenario, the receiver has been powered off for less then 2 hours since the last valid navigation solution.

The GPS uses its last Ephemeris data to calculate a position fix.

## 5. Pin Description

| Pin no | Name | | Pin Description | I/O | Note |
|---|---|---|---|---|---|
| | TTL | USB | | | |
| 1 | RXB | | | I | |
| 2 | VDD | | Supply Voltage | I | |
| 3 | TXA | DM | | I/O | |
| 4 | RXA | DP | | I/O | |
| 5 | GND | | Ground | | |
| 6 | TXB | | | O | 1PPS or TXB by S/W option |

## 6. Absolute Maximum Ratings

| Parameter | | Min | | Max | | Unit |
|---|---|---|---|---|---|---|
| | | TTL | USB | TTL | USB | |
| Power supply voltage(VDD) | | -0.3 | | 5.5 | | V |
| I/O port voltage | Pin no “3,6” | -0.3 | -0.3 | 3.0 | 3.3 | V |
| | Pin no “1,4” | -0.3 | -0.3 | 3.0 | 3.3 | |
| I/O port current | | | | ±10 | | mA |
| Storage temperature | | -40 | | 85 | | ℃ |

**Warning – Stressing the device beyond the “Absolute Maximum Ratings” may cause permanent damage. These are stress ratings only. Operation beyond “Operating conditions” is not recommended and extended exposure beyond the “Operating condition” may affect device reliability.**

## 7. DC Characteristics ( Test Temperature：25℃)

| Parameter | | | Condition | Min. | TYP | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Operating supply voltage (Hardware option select) | V4:OPEN, V3:OPEN | | VDD port | 4.5 | 5.0 | 5.2 | V |
| | V4:SHORT, V3:OPEN | | | 3.4 | 4.0 | 4.5 | |
| | V4:SHORT, V3:SHORT | | | 3.2 | 3.3 | 3.4 | |
| Operating supply ripple voltage | | | VDD port | | | 50 | mV |
| Sustained supply current at 3D Fixed | | TTL | VDD=5.0V | 32 | 33 | 36 | mA |
| | | USB | VDD=5.0V | 35 | 36 | 39 | |
| Peak supply current at GPS START operation | | TTL | VDD=5.0V | 30 | 32 | 34 | mA |
| | | USB | VDD=5.0V | 33 | 35 | 37 | |
| Standby Backup input current | | | V_BAT=3.0V | 5.0 | 6.5 | 15 | uA |
| I/O INPUT level | High | TTL | VDD=5.0V | 1.96 | 2.8 | 3.0 | V |
| | | USB | | 2.7 | | 3.3 | |
| | Low | TTL | VDD=5.0V | -0.2 | | 0.84 | |
| | | USB | | 0.1 | | 0.4 | |
| I/O OUTPUT level | High | TTL | Ioh=2mA VDD=5.0V | 2.4 | | 2.8 | V |
| | | USB | | 2.7 | | 3.3 | |
| | Low | TTL | Iol=2mA VDD=5.0V | 0.1 | | 0.4 | |
| | | USB | | 0.1 | | 0.4 | |
| Back-up Time | | | 24h charging | 20 | 30 | 40 | Days |
| Operating temperature | | | VDD=5.0V | -10 | 25 | +60 | ℃ |

* Operating Temperature

Electronics device : -40℃ ~ +80℃

Back-up Battery : -10℃ ~ +60℃

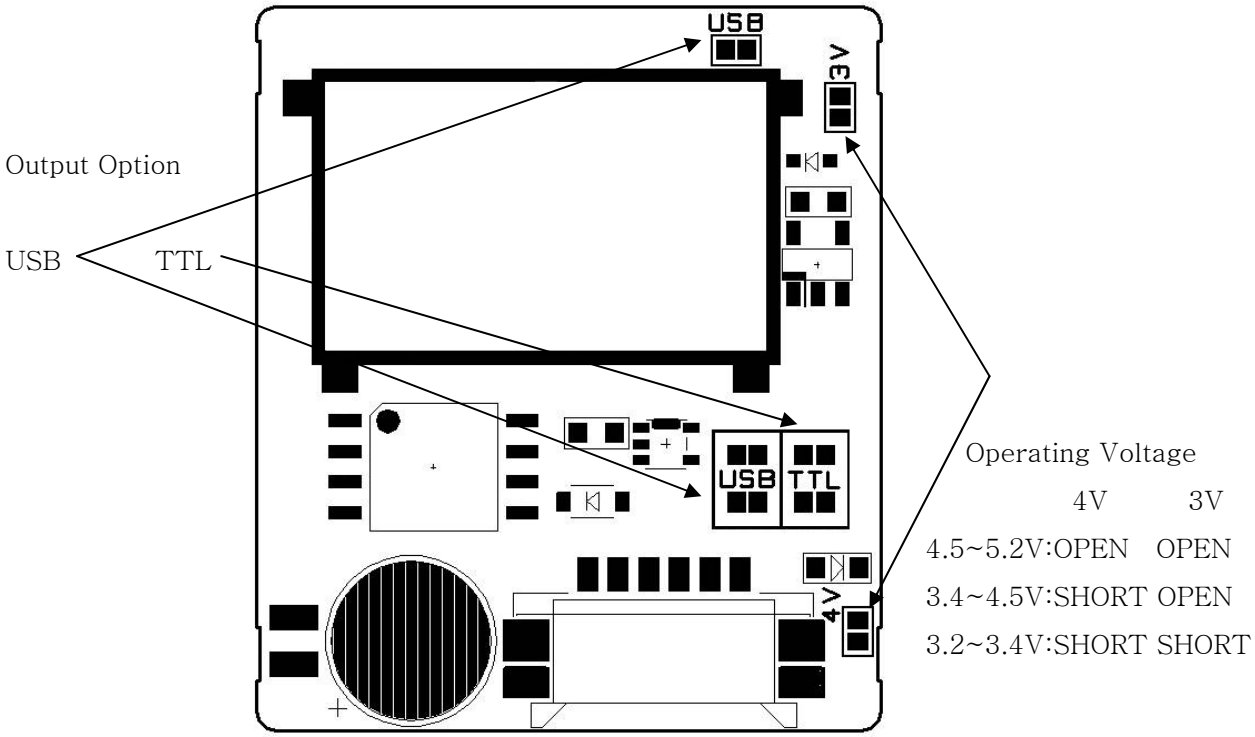
(Lithium-Ion Rechargeable Battery)

## 8. AC Characteristics

( Test Temperature : 25℃ VCC = 5.0V RF Input : Conducted )

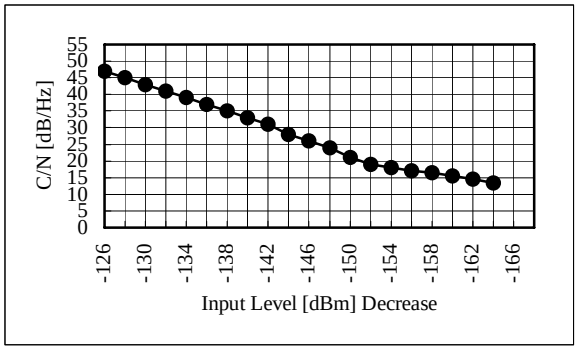
| Parameter | Condition | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| RF_IN Input level | | | | -40 | dBm |
| RF_IN Input Impedance | Fo=1575.42MHz | | 50 | | Ω |
| Tracking Sensitivity (C/N) | 3D (C/N avg. 15dB-Hz) | | -165 | | dBm |
| Re- Tracking Sensitivity (C/N) | 3D (C/N avg. 18dB-Hz) | | -155 | | dBm |
| Cold start Sensitivity (C/N) | 3D (SV 9EA in view) | | -148 | | dBm |
| Cold start time(TTFF) | -130 dBm(2D) (SV 9EA) | | 50 | | sec |
| Hot start time | -130 dBm(2D) (SV 9EA) | | 1 | | sec |
| Re-acquisition time (5 sec) | -130 dBm(3D) (SV 9EA) | | 3 | | sec |
| Re-acquisition time (60 sec) | -130 dBm(3D) (SV 9EA) | | 3 | | sec |
| Position error (Latitude, Longitude) | -130 dBm(SV 9EA in View) | | 10 | | m |
| Position error (Elevation) | -130 dBm(SV 9EA in View) | | 50 | | m |
| Operational Limits | Altitude | | | 18 | Km |
| | Velocity | | | 1,800 | Km/h |

## 9. Output option select point

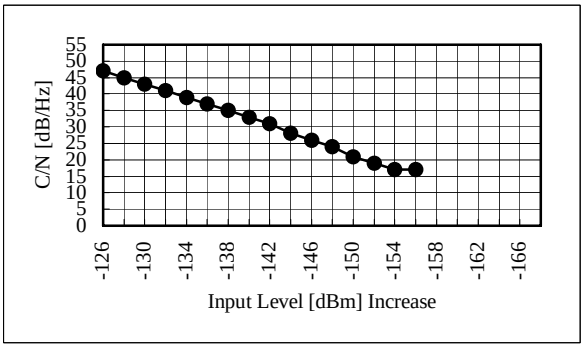


## 10. Performance Specification

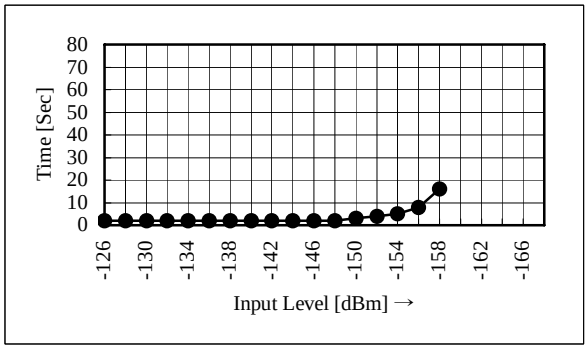
3D Tracking Sensitivity



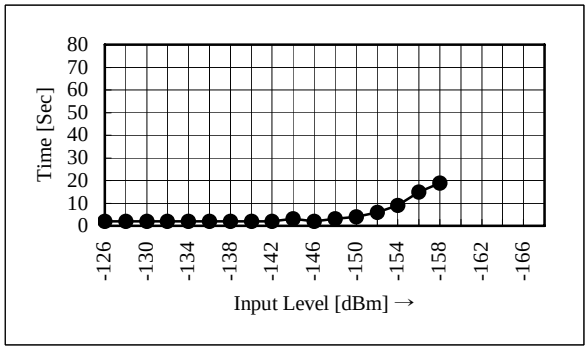

3D Re-Tracking Sensitivity




Re-Acquisition Time (After 5Sec)

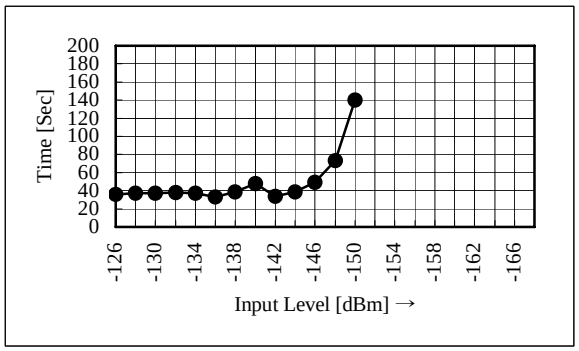



Re-Acquisition Time (After 60Sec)

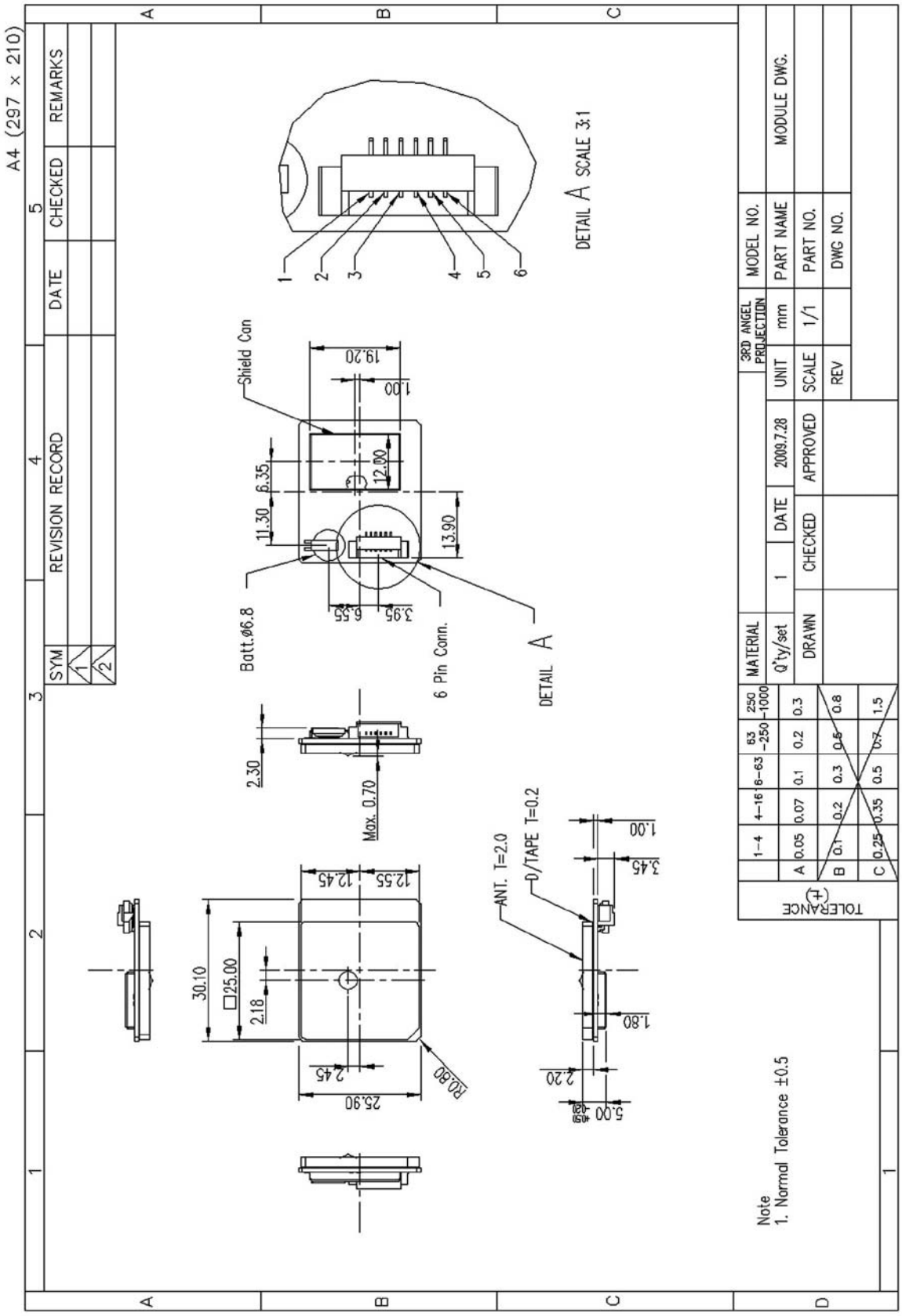



RF-IN Input Impedance

Cold Start Time (TTFF)



## 11. Mechanical Specification

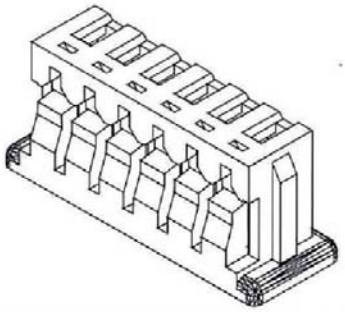


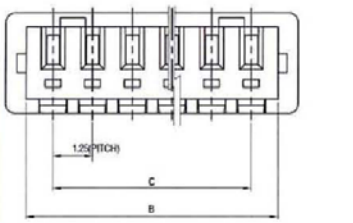
## 12. I/F Connector Specification (Wire_to_Board_Wafer)

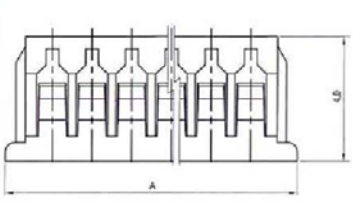
Wire to Board Wafer: http://yeonho.com/pdf/12505WR.pdf 12505WR-06A00
Wire to Board Housing: http://yeonho.com/pdf/12505HS.pdf 12505HS-06000

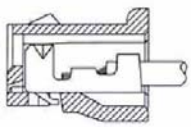
# 1.25mm (0.049") PITCH CONNECTOR

*Wire-to-Board Housing* — **12505HS Series**

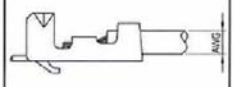




TERMINAL ASSEMBLY DRAWING




AWG : #28 ~ #32

**Material**

| NO | DESCRIPTION | TITLE | MATERIAL |
|---|---|---|---|
| 1 | HOUSING | 12505HS | PA66, UL 94V Grade |

**Available Pin**

| PARTS NO. | A | B | C |
|---|---|---|---|
| 12505HS-02000 | 4.25 | 2.95 | 1.25 |
| 12505HS-03000 | 5.50 | 4.20 | 2.50 |
| 12505HS-04000 | 6.75 | 5.45 | 3.75 |
| 12505HS-05000 | 8.00 | 6.70 | 5.00 |
| 12505HS-06000 | 9.25 | 7.95 | 6.25 |
| 12505HS-07000 | 10.50 | 9.20 | 7.50 |
| 12505HS-08000 | 11.75 | 10.45 | 8.75 |
| 12505HS-09000 | 13.00 | 11.70 | 10.00 |
| 12505HS-10000 | 14.25 | 12.95 | 11.25 |
| 12505HS-11000 | 15.50 | 14.20 | 12.50 |
| 12505HS-12000 | 16.75 | 15.45 | 13.75 |
| 12505HS-13000 | 18.00 | 16.70 | 15.00 |
| 12505HS-14000 | 19.25 | 17.95 | 16.25 |
| 12505HS-15000 | 20.50 | 19.20 | 17.50 |

**Specification**

| ITEM | SPEC |
|---|---|
| Voltage Rating | AC/DC 125V |
| Current Rating | AC/DC 1A |
| Operating Temperature | -25℃~+85℃ |
| Contact Resistance | 30mΩ MAX |
| Withstanding Voltage | AC250V/1min |
| Insulation Resistance | 100MΩ MIN |
| Applicable Wire | AWG #28~#32 |
| Applicable P.C.B | - |
| Applicable FPC/FFC | - |
| Solder Height | - |
| Crimp Tensile Strength | - |
| UL FILE NO | E108706 |

*Application Terminal : 12505TS (32 Page)*

## 13. Order Information Sheet

Model name : ME2530A

Buyer name :_____

Order Date :_____

Quantity :_____

Operating Voltage : [_____] (ex) 5V(4.5~5.2V), 4V(3.4~4.5V), 3.3V(3.2~3.4V)

Buadrate COM_A :[_____] (ex) NONE,4800,9600,38400,57600,115200

Buadrate COM_B :[_____] (ex) NONE/PPS,4800,9600,38400,57600,115200

NMEA Massage : GGA[__], GLL[__], GSA[__], GSV[__], RMC[__], VTG[__]

(ex) 0: No Output Message, 1~10: Interval time(sec)

If buadrate is 4800bps that GSV Interval time is 5 sec

Output Type : [_____] (ex) TTL, USB

Special :_____

Default

Operating Voltage : [ 5V ]

Buadrate COM_A :[9600bps]

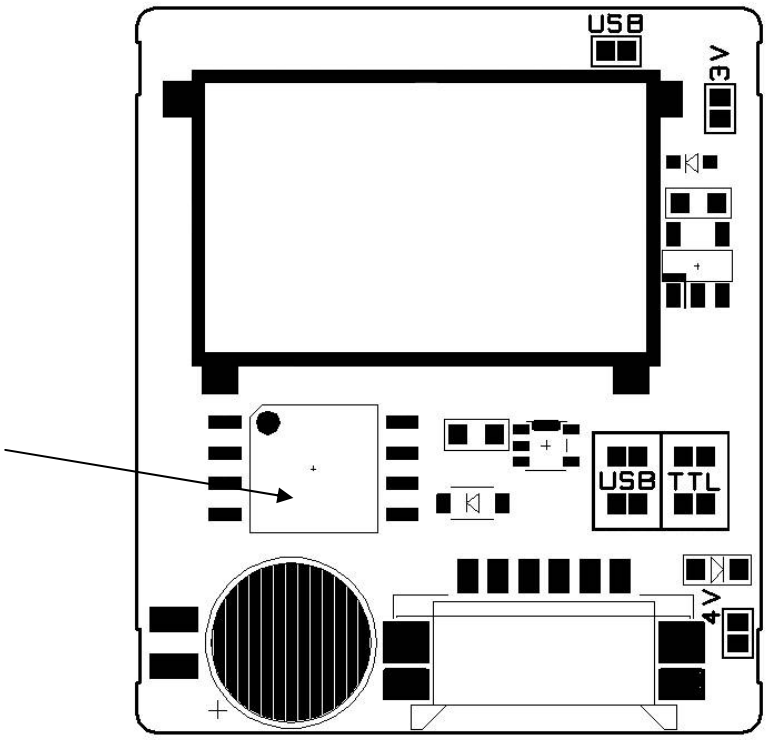
Buadrate COM_B :[NONE/PPS]

NMEA Massage : GGA[1], GLL[0], GSA[1], GSV[1], RMC[1], VTG[0]

Output Type : [TTL]

## 14. Position Data Log ( Buyer Order Option )

Log Data Memory Option
16Mbit,32Mbit or 64Mbit
Serial Flash Memory




Log data : NMEA0183 GPRMC

16Mbit : 120,000 POINT

32Mbit : 248,000 POINT (DEFUALT)

64Mbit : 504,000 POINT

GPS software : special

Logging READ & VIEWER PC Program : Demo program

Read format : KML, TXT