uPatch102

OEM GPS Receiver Module

- **Compact design with integrated antenna**
- **High performance, Cost effective design**
- **Suitable for GPS Mouse type of applications**

uPatch102 Key Features:

- Small form factor – 28 x 28 x 7.4 mm
- Low power consumption:
  - 145mW @ 3.3V (normal mode)
  - 60µW @ 3.3V (battery backup)
- Very high sensitivity:
  - 139dBm (Unaided Acquisition)
  - 150dBm (Navigation)
  - 152dBm (Tracking)
- NMEA0183 and Sony ASCII protocols
- Integrated 25 x 25 x 4 mm patch antenna
- Accurate 1PPS timing output
- Cold Start TTFF: 45s
- Battery backup for low power modes
- Based on SONY receiver architecture
- CXD2951-GL4 single chip LSI
- Two receiver options:
  - uPatch102-R (RS232)
  - uPatch102-C (CMOS)
- Default NMEA messages @ baud rates:
  4800: GGA,GSA,GSV,RMC
  9600: GGA,GSA,GSV,VTG,ZDA,PSGSA

New member to uPatch family

uPatch102 is a RoHS compliant upgrade to uPatch100. Two additional I/O-pins are added for baud rate select, otherwise the interface is identical to uPatch100

The uPatch102 integrates a high performance passive patch antenna. It is a versatile OEM GPS receiver for applications that require only an 'NMEA-machine' type of receiver. It is suitable for instance for GPS mouse type of applications where high performance and low cost are key issues.

High performance receiver architecture

The GPS chip used is SONY CXD2951-GL4 single chip LSI with built in ROM based firmware. In addition a one stage LNA, TCXO and RTC are included. Necessary on board regulators are also included for ease of use. Typical Cold Start TTFF is 38s. State-of-the-art signal acquisition and tracking circuitry enables weak signal capability in difficult environments.

Versatile interfaces

The uPatch102 is very easy to use. The 10-pin interface connector carries all necessary signals for making typical 'NMEA machine' type of applications possible.

The user needs only to connect the power supplies (main supply and battery backup supply) to make it functional. Low power mode is simply achieved by removing the main power supply at any time. The receiver will resume normal operation once the main power supply is reconnected.

NMEA0183 output can be customized using SONY ASCII protocol. The uPatch102 can be factory configured for either RS232 level or CMOS level serial interface. A USB version is also available.

A highly accurate 1PPS timing pulse is also available. A valid fix output can be used for indicating the state of the receiver (acquisition, tracking and navigation modes).

Specifications

uPatch102

General: L1 frequency, C/A code (SPS)
12 channels, WAAS/EGNOS compatible
Integrated antenna receiver
Separate search and acquisition engine

Update rate: 1 fix/s

Accuracy: Position: 3 m (CEP50), 7 m (CEP95)
Velocity: 0.1 m/s
Time: 40 ns RMS

TTFF: Cold Start: 45 s
Warm Start: 35 s
Hot Start: 8 s

Sensitivity: Acqusition (unaided): -139 dBm
Tracking: - 152 dBm
Navigation: - 150 dBm

Power Drain: Acqusition: 230 mW
Navigation: 145 mW
Battery backup: 60 µW

Pin	Name	I/O	Description	*uPatch102-C*
1	VDD	PWR	Main Supply (3.3V...5.5V)	
2	TX0	O	NMEA Output, 3.0V CMOS level	
3	RX0	I	SONY ASCII Input, 3.0V CMOS level	
4	GND	GND	Ground	
5	XRESET	I	External Reset, Active Low	
6	VBAT	PWR	Battery Backup Supply (3.3V...5.5V)	
7	1PPS	O	1 Pulse Per Second Output	
8	FIX	O	Valid Fix Indicator Output	
9	BAUD0	I	Baud Rate Select 0 Input	
10	BAUD1	I	Baud Rate Select 1 Input	

Pin	Name	I/O	Description	*uPatch102-R*
1	VDD	PWR	Main Supply (3.3V...5.5V)	
2	TX0	O	NMEA Output, RS232 level	
3	RX0	I	SONY ASCII Input, RS232 level	
4	GND	GND	Ground	
5	XRESET	I	External Reset, Active Low	
6	VBAT	PWR	Battery Backup Supply (3.3V...5.5V)	
7	1PPS	O	1 Pulse Per Second Output	
8	FIX	O	Valid Fix Indicator Output	
9	BAUD0	I	Baud Rate Select 0 Input	
10	BAUD1	I	Baud Rate Select 1 Input	

I/O Ports: One serial/USB data port
10-pin interface pads
Two Baud Rate Select pins
1PPS output
Valid fix indicator output
Main power supply
External Reset input
Battery backup supply

Protocol: NMEA 0183 ver 3.0
SONY ASCII

Dimensions: 28 mm x 28 mm x 7.4 mm (nominal)

Weight: 12 g

Operating voltage: 3.3V..5.5V (main supply)
3.3V..5.5V (battery backup supply)

Operating temperature: -40C..+85C

Antenna: 25x25x4 mm patch

GPS Receiver IC: CXD2951GL-4 Single Chip

Baud Rate	BAUD0	BAUD1	NMEA Messages
4800	HIGH	LOW	GPGGA, GPGSA GPGSV, GPRMC
9600	LOW	LOW	GPGGA, GPGSA GPGSV, GPRMC GPVTG, GPZDA PSGSA
19200	LOW	HIGH	GPGGA, GPGSA GPGSV, GPRMC GPVTG, GPZDA PSGSA
38400	HIGH	HIGH	GPGGA, GPGSA GPGSV, GPRMC GPVTG, GPZDA PSGSA