



Navika-111

GPS & GSM/GPRS based Application Engine

GPS Features

- 32-Channel high performance GPS-SBAS Receiver
Sensitivity
 - Acquisition: -155 dBm (Hot start, 1SV @ -140 dBm)
 - Tracking: -163 dBm
- TTFF
 - Hot Start: 2-3 Sec (Typical)
 - Warm Start: 30 Sec (Typical)
 - Cold Start: 35 Sec (Typical)
- 1PPS: <+/- 10ns, 1 σ
- Memory
 - 2Mbit on-chip SRAM
 - 32Kbit battery backed on-chip SRAM
 - 4Mbit SRAM
 - 8Mbit parallel Flash



Navika-111
(26mm x 50mm)

GSM/GPRS Features

- Quad Band GSM/GPRS 850/900/1800/1900 MHz
- Protocols : UDP/TCP/IP/HTTP
- GPRS : CLASS 12
- SIM card support : Normal, Micro, Nano

General Features

- Antenna Input
 - GPS
 - GSM/GPRS
 - FM
 - Bluetooth
- Industry standard peripherals
 - USB 2.0 with Full Speed PHY
 - CAN 2.0 controller
 - SPI
 - TWI (I2C compatible)
 - Serial Port
 - UART
 - General Purpose I/O
 - ADC input
- Form Factor: 26mm x 50mm

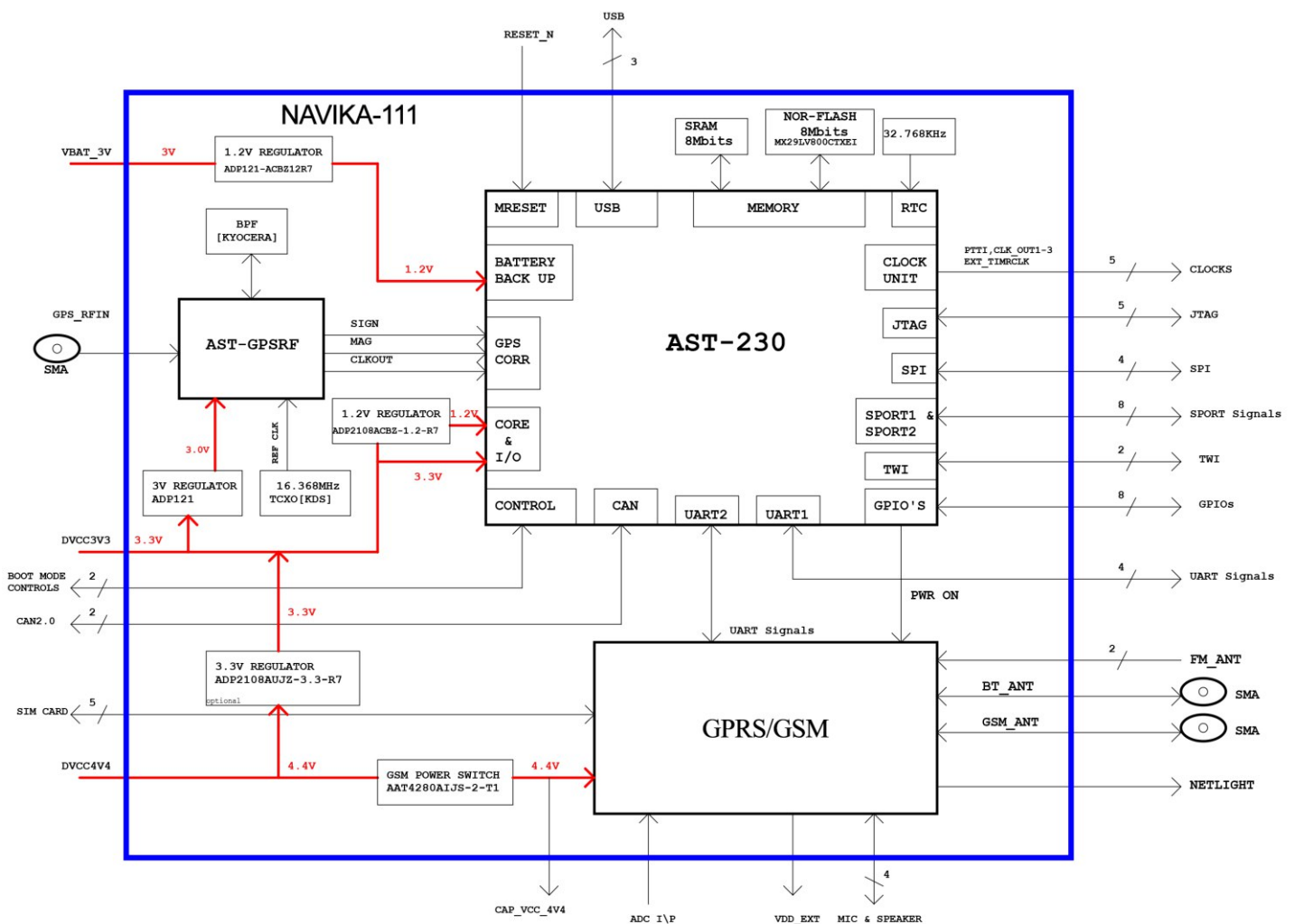
Product Description

Navika-111 is a GPS and GSM/GPRS based application platform designed to host a multitude of applications that need both GPS and GSM/GPRS. The compact design of Navika-111 consists of High performance GPS-SBAS module and Quad Band GSM/GPRS 850/900/1800/1900 MHz module (2G/3G).

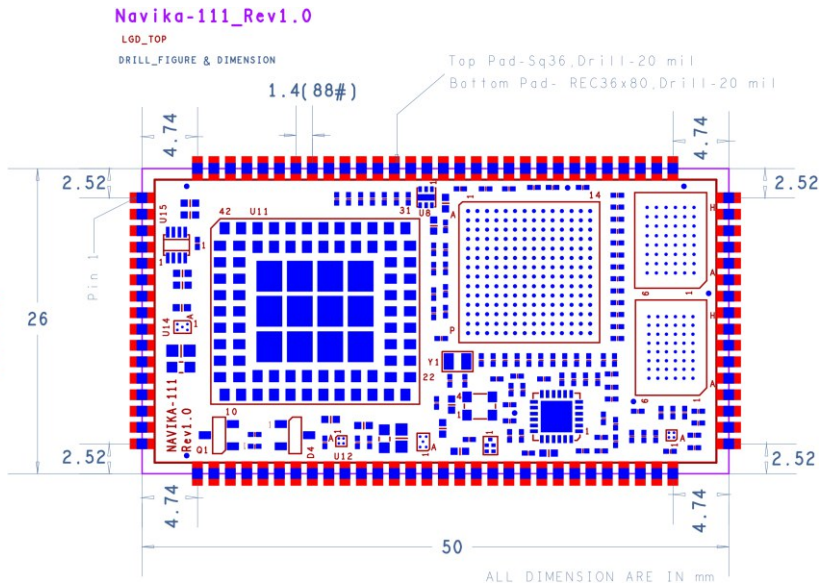
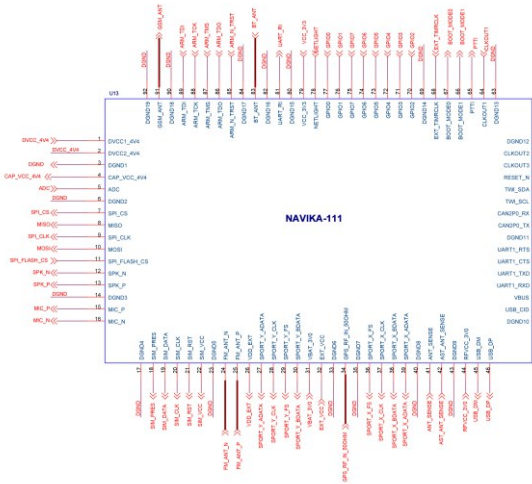
Navika-111 is a 26mm x 50mm module with LGA pads for assembly. With 92 interface pads, all the relevant power and signal connectivity are brought out of the module. For an application designer, Navika-111 offers an easy integration option with most of the key system elements already incorporated.

Navika-111 brings out the several industry standard peripherals for interface with the external world. USB 2.0 full speed PHY allow the AST-230 to be used for portable applications as a device. CAN 2.0 controller has been integrated to support automotive applications. Other standard peripherals like UART, SPI, TWI, Serial Port and ADC provides varied communication interface options. Internal peripherals such as Timers, RTC, Battery backed counter and Watch dog timer provide several options for event based applications.

Navika-111 supports a variety of memories both on and off chip. The on-chip memory of 2Mbits can be used to run application programs. Of this, 32Kbits is battery backed to facilitate retention of key configuration parameters. External SRAM of 4Mbits can be used to augment the runtime memory capacity while the 8Mbit parallel flash holds the application program.



Block Diagram of the Navika-111



Mechanical Details of the Navika-111

Performance Specifications of Navika-111

Time to First Fix

Hot Start (with valid ephemeris, almanac, position and time estimate) :2-3 sec (typical) switch OFF/ON cycle less than 1 hour

Warm Start(with almanac, position and time estimate) :30 sec (typical)

Cold Start (without almanac, time, or position) :35 sec (typical)

Note: Active antenna kept under open sky with HDOP<2 and C/N0 > 40dB-Hz

Accuracy

Position (Horizontal) :<2.5m (RMS)
Velocity :0.1 m/sec (90% without S/A)

Note: Active antenna kept under open sky with HDOP<2 and C/N0 > 40dB-Hz

Timing

1PPS : < +/- 10ns, 1σ
without errors
Pulse Width : 386us (adjustable between 386us to 500ms in steps of 386us)
Pulse Edge : Rising (configurable)
Pulse Delay : 0ns (adjustable between -999 to +999ns)

Environmental Characteristics

Operational Temperature Range (Ambient) :-40°C to +85°C
Storage Temperature Range :-65°C to +150°C
Humidity :95% non-condensing +30°C to 60°C
Altitude :18,000 meters

Electrical Characteristics

Total Current Consumption :2A @ 4.4V

Specifications of Navika-111

TWO WIRE INTERFACE (TWI)

System Clock	: 400 KHz
Modes	: Master, Slave, Multi-master
Interrupt	: Supported

SERIAL PORT (SPORT)

System Clock	: 22.5 MHz
Clock source	: Internally generated or External source
Word length	: 3 to 32 bits, big or little endian
Framing	: Supported
Interrupt	: Supported
I2S	: Supported
Multi-channel capability	: Supported
No of SPORT's	: 2

UART

Speed of operation	: Upto 1 Mbps
Type	: Full UART with frame control
Word length	: 7 to 12 bits
Interrupt	: Supported
DMA	: Supported
No of UART's	: 2

GPIO

No of GPIO's	: 12 bi-directional
Interrupt	: Supported

ADC

Voltage Range	: 2.8V
ADC Resolution	: 10 bit
Sampling Rate	: 1.0833MHz
ADC Precision	: 10 mv

TIMER

No of Timer's	: 3
External clock input	: Supported
Interrupt	: Supported

REAL TIME CLOCK (RTC)

Mode	: 32-bit free running counter
Clock	: 32.768 KHz crystal
Power down / wake up features:	: Supported

WATCH DOG TIMER (WDT)

Mode	: 32-bit counter; programmable through software
Configuration	: Core and Peripheral reset upon expiry of counter
Traceability	: Sticky bit to indicate if reset happened due to Watch Dog function

CLOCKS

System Clock	: 90 MHz (max)
Peripheral Clock	: 45 MHz (max)
Battery backed peripherals	: 32.768 KHz

RESET

Reset	: Active Low Chip Reset input, at least 25 ms low pulse
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JTAG

JTAG	: TDO, TDI, TCK, TMS and TRST lines
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POWER SUPPLY

Core Supply	: 4.4 V
I/O Supply	: 2.5 V / 3.3 V
Battery Supply	: 1.2 V

MECHANICAL

Dimensions	: 26mm x 50mm
Pads	: 92 LGA with edge plated connection points