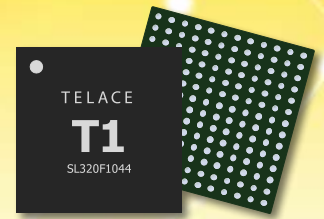


T1, GPS Single Chip Receiver

Overview

- GPS single chip including RF, baseband, and navigation S/W
- High accuracy with adaptive processing against a variety of signal level and variation
- Integrated signal processing with navigation S/W against multipath environments
- Resource sharing techniques and configurable architecture
- Low power structure and managements
- Matured proprietary CDM technology



Features

High Performance GPS Navigation

- Adaptive operation for high sensitivity and dynamics
- Advanced tracking loop and filter techniques against multipath environments
- Patented fast acquisition architecture
- SBAS support
- Real-time navigation

Multiple Environments Support

- Stationary, land vehicle, high dynamic airborne and military area

Multiple Protocol Support

- NMEA protocol
- TGB protocol
- Satellites and PVT information
- Customer configuration and masks
- Test and monitoring

A-GPS Support

- Fast position fix with aiding information

Architecture Highlights

- Stand-alone GPS architecture
- ARM processor embedded
- BBR and RTC for hot start and navigation parameter storage
- Various peripherals with 2 UARTs, 2 I2Cs, 2 SPIs, 2 general purpose timers, 1 watchdog timer, 1PPS, interrupt controller, and 10 GPIOs
- Optional external (Flash or SRAM) memory I/F for special purpose applications

Specifications

Position Accuracy

- Autonomous CEP¹ < 2m
- SBAS < 1.5m

TTFF²

- Hot < 1s
- Cold < 30s
- Aiding < 1s

Sensitivity

- Acquisition -145dBm
- Navigation -158dBm
- Tracking -162dBm

Receiver

- Tracking signal L1 C/A, SBAS
- Max update rate 2 Hz
- Protocol support NMEA
TGB binary

Power

- Autonomous Power 40 mW
- Power save 20 mW
- Sleep 10 uA

Package

- Type BGA
- Dimension 8 x 8 mm²

Operating Condition

- Temp. range -40 ~ 85°C

1. Static, -130dBm
2. 50%, -130dBm

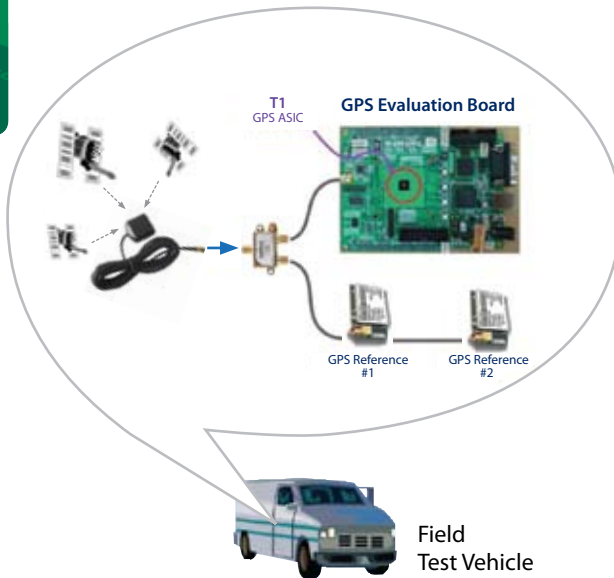
Interface

- GPS antenna (passive or active antenna)
- External SAW filter
- RF clock : TCXO (16,368, 16.367667 or 16.369 MHz)
- RTC clock : XTAL (32.768KHz)
- External Interface : UART, SPI, I2C, GPIO, EMI



T1, Test Results

Test Environments

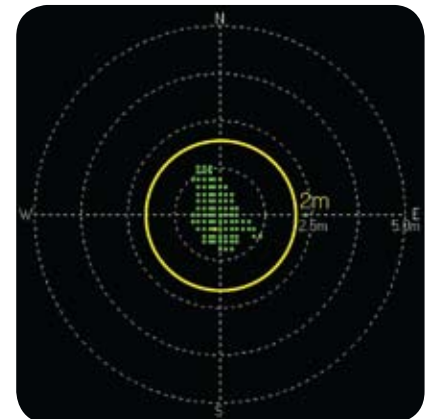


Logging Analysis



Sensitivity

- High sensitivity**
- Signal tracking sensitivity of -162 dBm

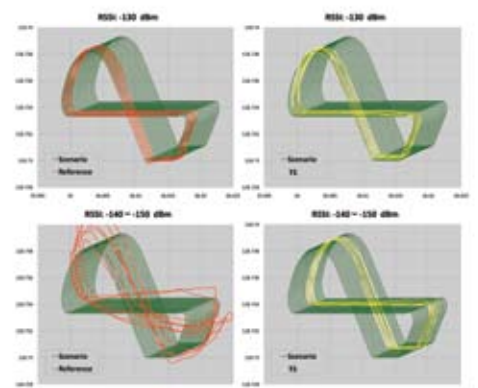


Accuracy Static

- Scenario**
- Static
 - Various signal levels
- Results**
- Stable and accurate positioning
 - Accurate positioning in low level environments

Accuracy Mobile

- Scenario**
- High speed mobile : 110Km/h ~ 180 Km/h
 - Various signal levels
- Results**
- Accurate positioning even in high speed and low level signal environments
 - High sensitivity in mobile environments



T1, Test Results (cont.)

Urban Canyon – High Rise Building



Open Sky



Urban Canyon – City Hall



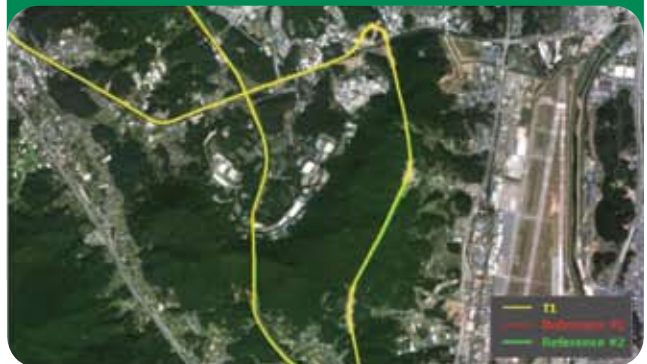
Overlaid Bridge



Urban Canyon – Subway Station



Tunnel In/Out



Urban Canyon – Walking



Interchange

