

**PRODUCT OVERVIEW**

MediaTek MT3333 is an All-In-One multi-GNSS (global navigation satellite system) system on a chip (SOC). Suitable for a wide range of mobile, automotive, timing, personal tracker, drone and industrial applications, MT3333 features high sensitivity (-165dBm tracking sensitivity) for enhanced performance in dense urban environments. The MT3333 family includes MT3333 – Multi-GNSS, MT3337 – GPS, and MT3339 – Extremely low power. MT3333, 3337, 3339 are all pin-to-pin compatible.

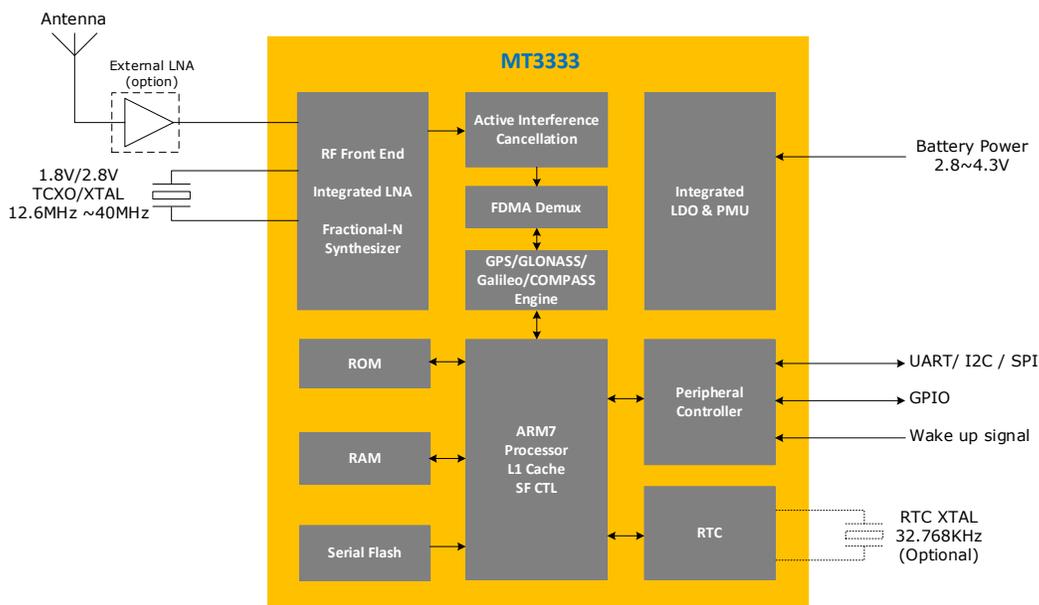
MT3333 requires just eight passive external components, and is pin-compatible for a flexible way to develop multiple tiers of mobile devices, while minimizing duplication in hardware development. MT3333 includes on-chip CMOS RF, digital baseband, ARM7 CPU and an embedded flash. It is able to achieve the industry’s highest level of sensitivity, accuracy and Time-to-First-Fix (TTFF) with the lowest power consumption in a small-footprint lead-free package. Its small footprint and minimal BOM requirement provide significant reductions in the design, manufacturing and testing required for portable applications.

With built-in LNA to reach total receiver chain NF to 2.2 dB, you can eliminate the external LNA. With its on-chip image-rejection mixer, the external SAW filter is also eliminated. The on-chip power management design allows MT3333 to be easily integrated into your system without extra voltage regulators. Both linear and a highly efficient switching regulator are embedded, allowing direct battery connection.

Up to 12 multi-tone active interference cancellers (ISSCC2011 award) offer you more flexibility in system design. The integrated PLL with Voltage Controlled Oscillator (VCO) provides excellent phase noise performance and fast locking time. A battery backed-up memory and a real-time clock are also provided to accelerate acquisition at the system restart.

MT3333 acquires and tracks satellites in the shortest time even at indoor signal levels. MT3333 supports various location and navigation applications, including autonomous GPS, GLONASS, GALILEO, BEIDOU, SBAS ranging (WAAS, EGNOS, GAGAN, and MSAS), QZSS, DGPS (RTCM) and AGPS.

Combined with many advanced features including EASY™, EPO™ and logger functions, the MT3333 provides always-on position with minimal power consumption. These features are excellent for portable applications such as DSC, cellular phone, PMP, and gaming devices.



## FEATURES

### Specifications

- GPS/GLONASS/GALILEO/BEIDOU receiver
- Supports multi-GNSS incl. QZSS, SBAS ranging
- Supports WAAS/ENGOS/MSAS/GAGAN
- 12 multi-tone active interference cancellers (ISSCC2011 award)
- RTCM ready
- Indoor/outdoor multipath detection and compensation
- Supports FCC E911 compliance and A-GPS
- Max. fixed update rate up to 10 Hz

### Advanced software features

- AlwaysLocate™ advanced location awareness technology
- EPO™/HotStill™ orbit prediction
- EASY™ self-generated orbit prediction
- Supports logger function

### RF configuration

- SoC, integrated in single chip with CMOS process

### Reference oscillator

- TCXO
  - Frequency 16.368 MHz, 12.6 ~ 40 MHz
  - Frequency variation:  $\pm 2.5$  ppm
- Crystal
  - Frequency: 26 MHz, 12.6 ~ 40.0 MHz
  - Frequency accuracy:  $\pm 10$  ppm

### ARM7EJ-S CPU

- Up to 158 MHz processor clock
- Dynamic clock rate control

### Pulse-per-second (PPS) GPS time reference

- Adjustable duty cycle
- Typical accuracy:  $\pm 10$  ns

### Power scheme

- A 1.8 volts SMPS build-in SOC
- Direct lithium battery connection (2.8 ~ 4.3 volts)
- Self build 1.1 volts RTC LDO, 1.1 volts core LDO, and 2.8 volts TCXO LDO

### Built-in reset controller

- Does not need external reset control IC

### Internal real-time clock (RTC)

- 32.768KHz  $\pm 20$  ppm crystal
- 1.1 volts RTC output
- Supports external pin to wake up MT3333

### Serial interface

- 3 UARTs
- SPI/I2C
- GPIO interface (up to 15 pins)

### Superior sensitivities

- Acquisition: -148 dBm (cold) / -163 dBm (hot)
- Tracking: -165 dBm

### Ultra-low power consumption (GPS+GLONASS)

- Acquisition: 37 mW
- Tracking: 27 mW
- AlwaysLocate™: 3.0 mW

### Package

- VFBGA: 4.3 mm x 4.3 mm, 57 balls, 0.5 mm pitch

### Slim hardware design

- 9 passive external components
- Single RF Front-End for Multi-GNSS frequency bands

### Compatibility

- Pin-to-pin compatible with MT3339/MT3337