Reliability Proven ETC Chip

MaaT-V

MaaT-V is a unique MCU that allows you to configure the essential features required for the automotive grade ETC OBU at a minimum cost. MaaT-V enables you to create fullperformance ETC OBU with minimal number of external parts, small size and high reliability. You can easily start developing inexpensive but high-performance ETC OBUs with the AEC-Q 100 Grade 2 certified MaaT-V chip.

High-performance CPU & Large-capacity memory

MaaT-V's Cortex-M3 80MHz high-performance CPU, 8MB of S-FLASH, and 8MB of large-capacity SDRAM are built-in, so RTOS can be loaded and multi-tasking and ASN.1 can be applied. In addition, it provides convenient functions such as real-time system monitoring and communication log storage and a flexible S/W development environment.

Various peripheral interfaces

MaaT-V has built-in UART, I2C, SPI, I2S, SCI, GPIO, DAC, WDT, TIMER, etc. including USB1.1, and can easily interface with versatile peripheral devices.

THoPACK audio Lossless & high-efficiency compression

THoPACK, uniquely developed by Ranix, minimizes the memory capacity for voice storage with lossless, high-efficiency compression and high-quality audio output, and supports DMA function to play OBU operation status and billing results through AUDIO DAC without CPU workload. The voice message through THoPACK, tells the driver OBU operation results and other informations at ease.

Highest performance DSRC modem & RF transceiver

MaaT-V receives data stably despite preamble loss and severe duty change due to doppler shift and multipath fading that may occur in an automobile speeding at 160 km . In addition, it supports various test modes that can be conveniently used for ITSC certification, and it is equipped with an RSU function to communicate with the OBU, making it possible to build communication verification facilities (test RSU) at lower cost in mass-production.

Automotive-optimized, high reliability and affordable ETC OBU solution

MaaT-V is AEC-Q100 Grade2(-40℃ to +105℃) certified to guarantee the electrical and environmental reliability required for automotive grade. Also, it is possible to implement a high-performance in-vehicle ETC OBU at lower cost.

RANIX

SPECIFICATIONS & FEATURES

CPU & Memory

- Core : Cortex-M3 (80MHz) High performance CPU
- Support XTAL or OSC clock source
- Support RTOS and ASN.1
- S-FLASH 8MB (MCP)
- SDRAM 8MB (MCP)
  - RTOS operation possible
  - ASN.1 Processing available
  - THoPACK Sound Play available
  - Multi-tasking possible
  - Real-time communication log storage support

High-Performance DSRC Modem

- Enhanced frame detector
  (Enhanced Symbol Time Acquisition)
- Symbol Frequency-offset Tracking
- Ensuring Dynamic range & Frequency Offset margin
- Support OBU and RSU mode
- WAKE-UP signal (14KHz square-wave) generation support
  for RSU mode
- Auto-CRC check
- Support ITSC test mode
  - Single tone output
  - PN9 sequence output
  - Constant value ('0' or '1') output
  - FM0 encoded/decoded data and programmable test clock out

Audio

- Support excellent quality audio :
  THoPACK* with lossless codec and included I2S can
  be reduced memory size for audio.
   * THoPACK is a audio compression format providing lossless,
  high-quality and a unique hybrid compression mode by RANiX.

Analog

- Internal POR / BOR
- Dual PLLs (System, USB)
- DAC : 1CH

Auxiliary Functions

- Internal LDOs (Core & Smart card)
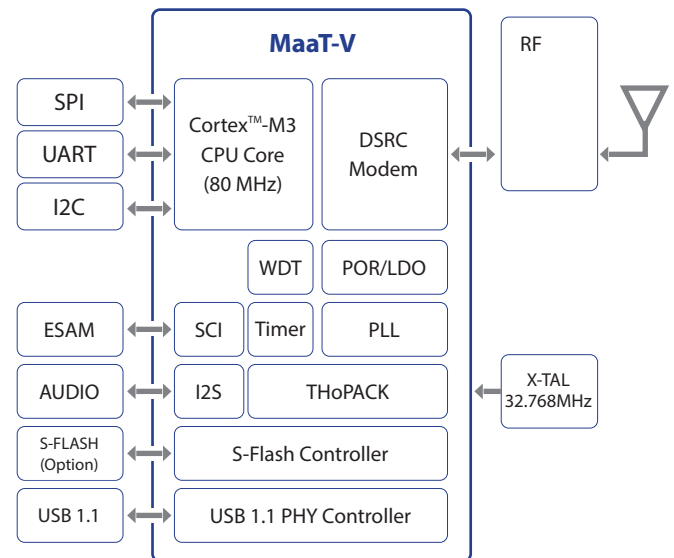- JTAG support

Power

- Single Power : CPU 3.3V only

Temperature & ESD

- AEC-Q100 Grade 2 (-40℃ to +105℃)
- Operating & Storage Temperature : -40℃ to +105℃
- ESD : 2kV

Package

- 100pin LGA (14x14mm, 0.5mm Pitch)

Block Diagram

Contact