

## Advanced Technology Roadside Unit

### RSU-5940 PCBA



### RSU Platform

The RSU-5940 is a V2X Printed Circuit Board Assembly (PCBA) designed for enabling RSU functionality in Traffic Infrastructure deployment in North America. Our company leveraged over a decade of research and development expertise working with relevant standards bodies, government research organizations, and OEMs to develop a platform capable of meeting anticipated minimum performance requirements and supporting initial V2X use cases for day 1 deployment and beyond.

- PCB Assembly form factor designed for integration into rugged RSU enclosures
- Dynamic Signage
- Traffic Signal Controllers
- Other Traffic Infrastructure
- Automotive grade components
- Adaptable to various business models
- PCB, Full Kit and different system integrators

### Quality & Stability

- Tier 1 supplier of OEM safety and communication products
- 75 Years of success in the automotive market and will be able to support long term

### Features

- Embedded Web User Interface
- Remote RSU configuration management & diagnostic features
- Antenna fault detection
- Antenna diversity: LTE-V2X: RX & TX diversity

Support latest versions of:

- NTCIP 1218 v01.38
- CTI 4001 v01.01 and CTI 4501 v01.01

### Applications

- Signal Phase and Timing / MAP
- Freight/Transit Signal Priority (FSP/TSP)
- Emergency Vehicle Preemption (EVP)
- Traveler Information Messages (TIM)

Can Facilitate:

- Curve Speed Warning
- Speed Compliance / Work Zone
- Oversize Vehicle Compliance
- Red Light Violation Warning
- Emergency Vehicle Warning
- Numerous other applications

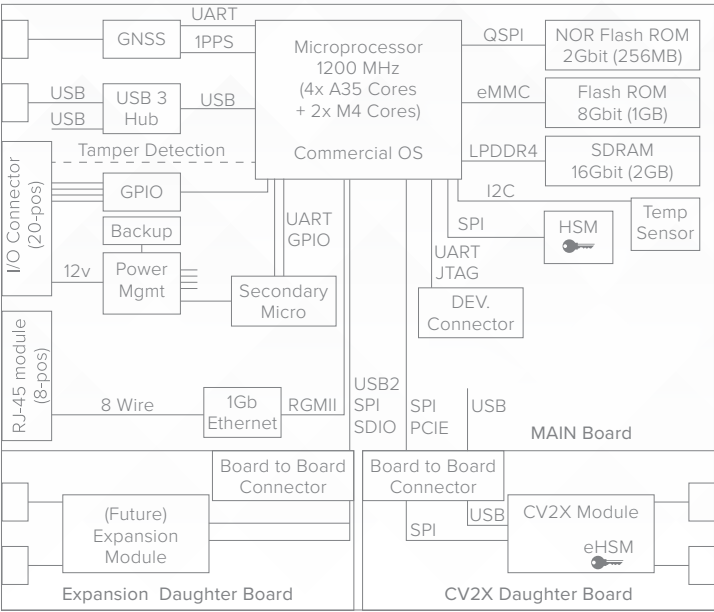
### Security

- Based on industry best practice ISO 21434
- V2X Hardware Security module (HSM)
- NIST/Brain pool ECC up to 512b
- HSM storage > 10k keys, 15-year retention
- FIPS 140-2 Level 3 / EAL6+
- Integrated Firewall
- Secure Boot

### Integration

- Our RSU integrates well with intersections using camera and radars to detect VRUs and can issue real-time alerts to drivers

## Hardware Architecture



## Core Features

- U.S. (IEEE, SAE) protocols
- V2X Facilities Software (SAE protocols)
- V2X Services API (GNSS, V2X Radio)
- Quad-core ARM A35 @ 1.2GHz + M4 (~9000DMIPS)
- 2GB LPDDR4 SDRAM
- 256MB QSPI NOR flash
- 8GB eMMC mass storage
- LTE-V2X R14/15 radio
- GNSS for position and timing
- USB 3.0 (Type-C)
- USB 2.0 Debug (microB)

## Standard Conformance

- IEEE 1609
- SAE J2735
- SAE J2945/1
- SAE J3161/1
- NTCIP 1218 v01.38
- SLSS aware

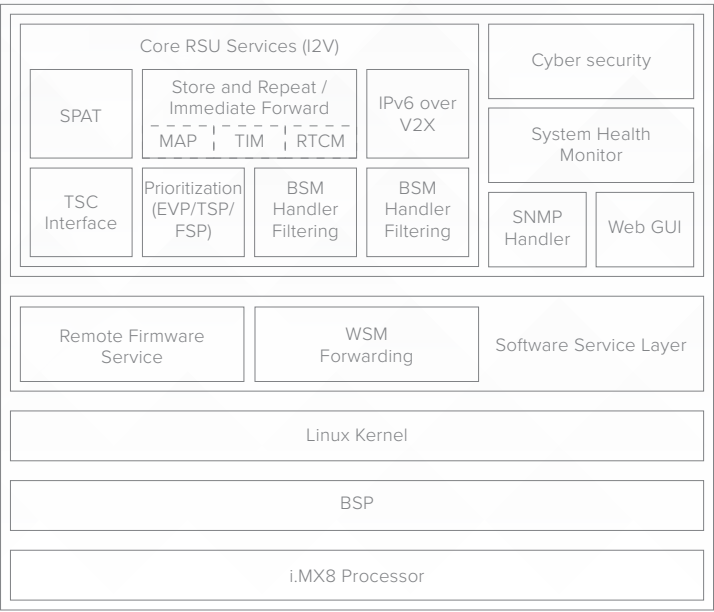
## Frequency Band

- LTE-V2X: 5.9GHz ITS (5895 – 5925 MHz)
- GNSS: L1 C/A, L1OF, B1, B1I, E1/BC, G1



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## Software Architecture



## Specifications

- Bandwidth**
- LTE-V2X: 20MHz, IEEE Ch. 183
- Antenna Diversity**
- LTE-V2X: RX Diversity (MRC), TX Diversity (CDD)
- Max Transmit Power**
- LTE-V2X: Up to +23 dBm
- Receiver Sensitivity (single input)**
- LTE-V2X target: -95dBm
  - (MCS 11, 367 octets, HARQ)
- GNSS**
- 2.0m CEP (up to 10Hz)
- V2X Security**
- NIST/Brainpool ECC up to 512b
  - HSM storage > 10k keys, 15-year retention
  - FIPS 140-2 Level 3 / EAL6+
- Operating System**
- Embedded Linux
- Operating Temperature Range**
- 40°C to +85°C (PCBA)
  - Intended for RSU integration compliance with ITE CTI 4001
- Dimensions**
- 140mm x 115mm x 35mm
- Power Supply**
- 12V ±10% (< 12 Watts)