Product summary
VERA-P3 series

DSRC 802.11p V2X host-based modules

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Standard

Professional

Automotive

Compact 802.11p automotive grade module with RX-diversity

- Automotive grade 802.11p V2X transceiver modules for infrastructure and vehicles
- Compliance with WAVE and ETSI ITS G5 for US and Europe operation
- Product variants: Diversity and single antenna (no diversity)
- Operational in ambient temperature –40 °C to +105 °C
- Suitable both for on-board-unit (OBU) and road-side-unit (RSU)
- Low power consumption
- Supports smart antenna deployment

24.8 × 29.6 × 3.5 mm
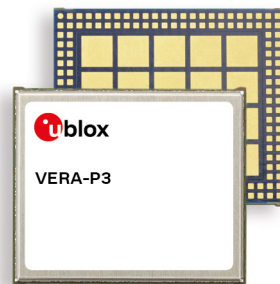
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VERA-P3

Product description

The VERA-P3 series compact modules provide full 802.11p functionality for V2X applications. These automotive grade modules are based on the u-blox UBX-P3 chip for 802.11p, which offers superior RF performance and is qualified in accordance with the highly demanding AEC-Q100 grade 2 specification. The modules operate on the 5.9 GHz frequency band.

VERA-P3 is fully compliant with IEEE WAVE and ETSI V2X requirements. The modules support diversity in both transmit and receive directions, thus providing vehicles full coverage with no "dead" areas.

VERA-P3 modules feature an Ethernet host interface, which allows maximal flexibility in placing the module in a vehicle, independent of the distance from the host processor. They offer a solution for smart antennas and distributed systems in the vehicle and support operation of smart antenna compensator.

Key features

- Frequency band: 5.9 GHz (802.11p)
- Channel width: 10 / 20 MHz
- Tx-mask IEEE 802.11p Class C (5 GHz band)
- Operation modes:
  - 802.11p single channel with diversity
  - 802.11p dual channel without diversity
- Data rates up to 27 Mbs (10 MHz channel) and 54 Mbs (20 MHz channel)
- ECDSA verification supporting NIST/Brainpool curves, with a minimum throughput of 1000 verifications/sec
- Secure boot from a host CPU or an external flash memory
- PPS interface for communication with GNSS receivers

	VERA-P311	VERA-P321
Grade		
Automotive	•	•
Professional		
Standard		
Radio		
IEEE 802.11 standards	p	p
Channel width [MHz]	10 or 20	10 or 20
Rx/Tx diversity		•
Antenna type	1a	2a
OS support		
Android / Linux (from u-blox)	Linux	Linux
QNX (via third party)	o	o
Interfaces		
High-speed UART	3	3
Ethernet (RGMII/MII/Reverse MII)	1	1
SDIO [version]	v3	v3
GPIO	10	10
PPS	1	1
Features		
Antenna diversity		•
Single channel operation	•	•
Security acceleration engine	•	•

1a = 1 pin for 11p   2a = 2 pins for 11p   o = On request

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VERA-P3 series

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Features

Wi-Fi standards	IEEE 802.11p
Frequency bands	5.9 GHz (channels 172-184)
Antenna	1 or 2 antenna pins (5 GHz band)
Transmitter	Single channel and diversity (cyclic shift diversity) Tx Output power: 25 dBm (maximum)
Receiver	Single channel and diversity Sensitivity (indicative): -98 dBm (MCS0 - 1 Rx antenna) -100.2 dBm (MCS0 - 2 Rx antennas)
Security	Security acceleration for ECC implementing the ECDSA algorithm Compliant with 1609.2 IEEE/WAVE (for US) and ETSI TS-103-097 (for EU)
Auxiliary ADC	For antenna diagnostics

Software features

V2X/Wi-Fi operational modes	V2X single and dual channel Channel switching support (1609.4) Congestion control (DCC) metrics reporting Timing synchronization support
Host support	Linux, QNX
Security	Secure boot

Interfaces

Host interface	1 Ethernet (RGMII/MII/Reverse MII) 1 SDIO v3.0, speed up to 200 Mbit/s
Flash interface	1 Quad/Octal SPI
GNSS interface	1 UART, speed up to 4 Mbit/s 1PPS
Other interfaces	10 GPIOs 1 RESET + 1 POWER ON

Package

Dimensions	24.8 x 29.6 x 3.5 mm
Pin-out	LGA package, 160 pins additional large ground pins)

Environmental data, quality and reliability

Operating temperature	–40 °C to +105 °C
Chip	AEC-Q100 Grade 2
Module	Automotive qualification according to ISO 16750-4

Electrical data

Power supply	3.3 V and 5 V
I/O power supply	3.3 V, 3 V, 2.5 V and 1.8 V
Power consumption	TBD

Certifications and approvals[1]

Europe (ETSI RED)
US (FCC CFR parts 15, 90 (RSU), and 95 (OBU))

1 = Pending approval: additional country certifications are planned

Support products

EVK-VERA-P321	Evaluation kit for VERA-P321 modules

Product variants

VERA-P311	Module with single antenna
VERA-P321	Module with dual antenna, single channel with diversity

Further information

For contact information, see www.u-blox.com / contact-us.

For more product details and ordering information, see the product data sheet.