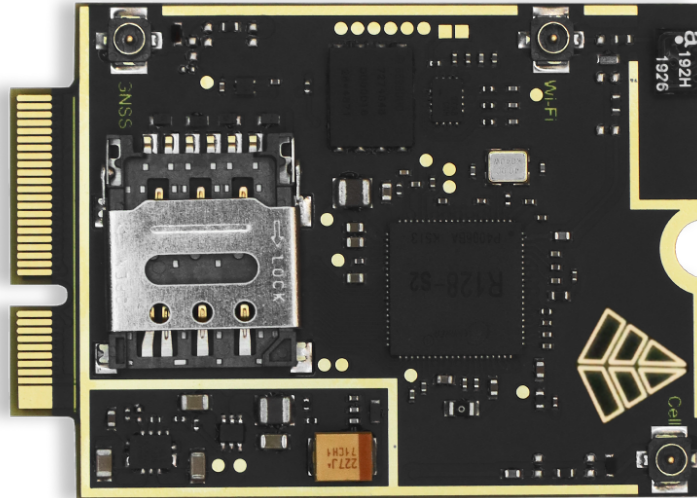# Prizm Connectivity Card Datasheet

Functional Description

Overview

The PRIZM Connectivity Card seamlessly integrates connectivity, security, and performance into a compact solution designed to address the complex challenges of IoT integration. With an efficient M.2 form factor, it optimizes space and power consumption, simplifying direct motherboard connections. The cellular module supports LTE Cat 1 for robust wireless communication, ensuring global roaming and compatibility with legacy systems, which enhances product design and reduces integration friction for engineering teams. Performance is driven by a high-efficiency RISC-V CPU and an ARM M33 processor for real-time operations, enabling effective on-board pre- and post-processing. Additionally, dual-mode Bluetooth and 802.11b/g/n WLAN capabilities facilitate simultaneous data transmission for seamless connectivity. Security is paramount; the Connectivity Card features a secure element designed with a zero-trust policy and secure key storage to protect cryptographic keys and sensitive data from threats. By employing encryption and robust access controls, it safeguards critical information while minimizing the complexities of integrating security devices. This comprehensive solution empowers engineering teams to develop reliable and secure IoT applications efficiently.

Features

LTE Cat 1 Module

- Supports LTE-FDD frequency bands including B1, B3, B5, B7, B8, B20, and B28.

- Wide operating temperature range from -40℃ to +85℃

- Power consumption of 1.5 mA during LTE operation

- Data transfer rates of up to 10 Mbps downlink and 5 Mbps uplink over LTE.

- Integrated Multi-GNSS with GPS/GLONASS/Galileo/BeiDou

Industrial IoT ESim

- Coverage in 100+ Countries

- Global Platform 2.3

- ETSI TS 101 220 ETSI TS 102 221

- 3GPP TS 31.101 3GPP TS 31.111

- 3GPP TR 31.900 3GPP TR 31.919

- Supported Bearers encompassing 2G, 3G, 4G, LTE-M, NB-IoT

- Data Retention of upto 10 years

- Read/Write Cycles upto 500,000

- External micro Sim support

Compute SoC

CPUs

- 64-bit RISC-V CPU up to 600 MHz

- 64-bit RISC-V CPU up to 600 MHz

Memories

- 1MB SRAM

- 16 MB Flash

- 16 MB PSRAM

WLAN

- Compatible with 802.11b/g/n standard

- Single-band 2.4G 1T1R WLAN

- WPA/WPA2/WPA3 personal, WPS

- Integrated LNA PA and T/R switch

- STA, AP, STA/AP, and Monitor modes

- Supports Wi-Fi and Bluetooth Co-existence

Bluetooth

- Dual-mode BT5.0

- Bluetooth specification v5.0, and compatible with v4.0/4.1/4.2 devices

- Bluetooth Low Energy 1 Mbps, 2 Mbps, and long range

Audio

- 3 ADCs, 95 dBc SNR, 24-bit, 8 KHz to 96 KHz sample rate

- 2 DACs, 105 dBc SNR, 110 dBc DNR, 24-bit, 8 KHz to 384 KHz sample rate

- 5-band DRC and 20-band hardware EQ

- I2S/TDM/PCM: 8-32 bit, TDM supports 16 channels

- DMIC: 4 channels support max 8 DMICs input

- Supports hardware voice activation detection (VAD)

Security

- TEE: TrustZone-M

- Secure boot

- Secure memory/eFuse

- JTAG/SWD protection

- HW crypto engine (RSA/AES/DES/3DES/MD5/SHA/SHA256/TRNG)

Peripherals

- USB 2.0 DRD

- 2 UART interfaces

- 2 SPI interfaces

- 8 PWM out

- 8 10-bit SAR GPADC

- 2 I2C interfaces

- Multi-channel DMA

Secure element

- P-256 Elliptic Curve Cryptography (ECC secp256r1) PKI support

- Cryptographic co-processor with JIL rated "high" key storage

- Protected storage for up to 16 Keys, certificates or data

- NIST standard P256 elliptic curve support (ECC)

- FIPS SP800-56A Elliptic Curve Diffie-Hellman (ECDH)

- Networking key management support

- Turnkey PRF/HKDF calculation for TLS 1.2 & 1.3

- One Permanent Primary Key Fixed at Manufacturing Time

- One Internal Sign Key for Key Attestation

- Encryption/Authentication for messages to prevent on-board attacks

- Internal high-quality FIPS 800-90 A/B/C Random Number Generator (RNG)

- Two high-endurance monotonic counters

- Guaranteed unique 72-bit serial number

- Secure boot support

- Operating temperature up to 100C

- 150nA Sleep current

Buck-Boost Converter

- 1.8V to 5.5V Input Voltage Range

- 3A Maximum Output Current

- 96% Peak Efficiency (VIN = 3.6V, VOUT = 3.3V)

- Low Supply Current that Extends Battery Life

- Skip Mode that Reduces Supply Current at Light Loads

- Integrated Protections that Provide System Robustness

- Undervoltage Lockout

- Overvoltage Protection

- Thermal Shutdown

- Active Output Discharge

Connectors and interfaces

- MCRF connector for Cellular antenna

- MCRF connector for GNSS antenna

- MCRF connector for WIFI antenna

- M.2 (NGFF) 2240 form factor with E-key Edge connector