RAK7240 WisGate Edge Prime Datasheet

Overview

Description

The **RAK7240 WisGate Edge Prime** is an ideal product for large scale LPWAN deployment where cost is essential, however, there is no compromises to be made on quality. Its wide range of customization options allows for flexibility when deploying a solution. With its industrial-grade components and high class of ingress protection, it achieves a high standard of reliability.

The Gateway provides for a solid out of the box experience where quick deployment is required. Additionally, since its software and User Interface sit on top of OpenWRT, it is perfect for the development of custom applications (**via the open SDK**).

Thus, the **RAK7240 WisGate Edge Prime**, is suited for any use case scenario, be it rapid deployment or customization with regards to User Interface and functionality.

Features

Hardware

- **IP65** industrial-grade enclosure with cable glands
- **PoE** + Surge Protection
- Dual LoRa Concentrators for up to **16 channels**
- Backhaul: **Wi-Fi**, **LTE**, and **Ethernet**
- **GPS**
- SD Card slot

Software

- Built-in LoRa Server
- OpenVPN
- Software and UI sit on top of **OpenWRT**
- LoRaWAN 1.0.3
- **LoRa Frame filtering** (node whitelisting)
- **MQTT v3.1** Bridging with **TLS** encryption
- **Buffering of LoRa frames** in case of NS outage (no data loss)

Specifications

Overview

The overview presents the RAK7240 circuit board and its block diagram that shows how the module's components work.

Circuit Board (Board Overview)

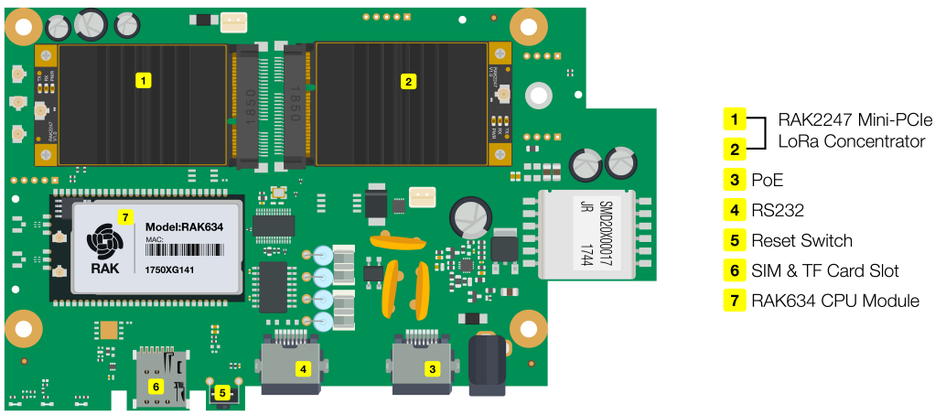

Figure 1: RAK7240 WisGate Edge Prime Circuit Board

Block Diagram

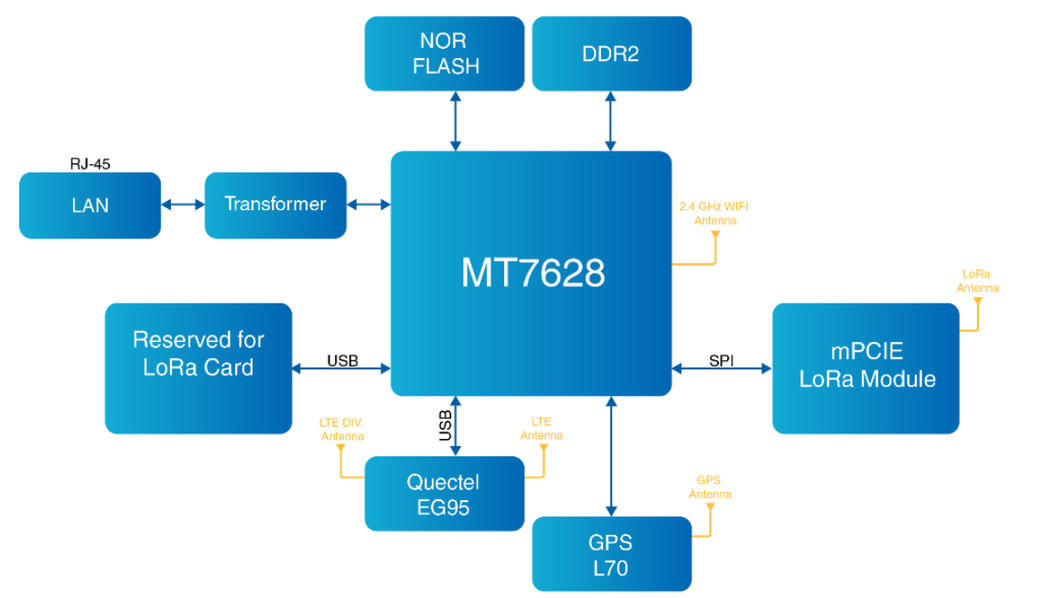

Figure 2: RAK7240 WisGate Edge Prime Block Diagram

Hardware

The hardware specification is categorized into four parts. It discusses the interfaces and the parameters of the RAK7240. It also covers the LoRa and Wi-Fi specifications of the board.

Interfaces (Hardware Interfaces)

The hardware interfaces of **RAK7240 WisGate Edge Prime** include five (5) antenna ports (LoRa, LTE-DIV/LoRa2, LTE-MAIN, WiFi, and GPS), six (6) status indicator LEDs, TF Card and nano-SIM sockets, a console port, an Ethernet Port (PoE), and a ground pad, as shown in the following figure:

Figure 3: RAK7240 WisGate Edge Prime Hardware Interfaces

LED Indicators

The status of the LEDs is described as below. Please refer to the printing of the LEDs on the mainboard.

LEDs	Status Indication Description
PWR	Power Indicator, LED is **ON** when the device is powered
ETH	• **ON** – link is up • **OFF** – link is down • **Flashing** – Data is being transferred
LoRa®	• **ON** - LoRa module 1 status is up • **OFF** – LoRa module 1 status is down • **Flashing** – LoRa module 1 data is being transferred
ACT *(LTE)*	• **Slow Flashing** (*200ms Bright/1800ms Dark)* - searching for network • **Slow Flashing** (200ms Dark/1800ms Bright) - idle status (online) • **Fast Flashing** - Data is being transferred
STAT *(16 channels only)*	• **ON** - LoRa module 2 status is up • **OFF** – LoRa module 2 status is down • **Flashing** – LoRa module 2 data is being transferred
WLAN	**AP Mode** • **ON** - WLAN status is up • **Flashing** - Data is being transferred **STA Mode** • **Slow Flashing**(1Hz) - Disconnected • **ON** - Connected • **Flashing** - Data is being transferred

Main Specifications

Feature	Specifications
Computing	MT7628, DDR2RAM 128MB
Wi-Fi Feature	• **Frequency**: 2.400-2.4835GHz (802.11b/g/n) • **RX Sensitivity**: -95dBm (Min) • **TX Power**: 20dBm (Max) • **Operation Channels**: 2.4GHz: 1-13
LoRa Feature	• **Card**: SX1301 Mini PCIe card (connects maximum of two), • **Channels**: 8 Channels (Optional: 16 channels) • **RX Sensitivity**: -139dBm (Min) • **TX Power**: 27dBm (Max) • **Frequency**: EU433 / CN470 / RU864 / IN865 / EU868 / US915 / AU915 / KR920 / AS923
Cellular Feature	**Variant for Europe** • LTE FDD: B1/B3/B7/B8/B20/B28A • WCDMA: B1/B8 • GSM: 900/1800MHz **Variant for North America** • LTE FDD: B2/B4/B5/B12/B13 • WCDMA: B2/B4/B5
Power Supply	PoE (IEEE 802.3af) - 42~57V DC
Power Consumption	12 W (typical)
Ethernet (ETH)	RJ45 (10/100M)
Console	RJ45 (RS232)
Antenna	5 N-Type connectors
LEDs	LoRa LED (1), Cellular (2), POWER (1), ETH (1), WI-FI (1)
Ingress Protection	IP65
Enclosure Material	Aluminum
Weight	1.3 kg
Dimension	224 mm x 121 mm x 42 mm
Operating Temperature	-30˚C to +55 ˚C
Storage Temperature	-40˚C to +85 ˚C
Operating Humidity	0% to 95% (non-condensing)

Feature	Specifications
Storage Humidity	0% to 95% (non-condensing)
Installation Method	Pole or Wall mounting

RF Specifications

LoRa Radio Specifications

Feature	Specifications
Operating Frequency	EU433 / CN470 / RU864 / IN865 / RU864 / US915 / AU915 / KR920 / AS923
Transmit Power	27dBm (Max)
Receiver Sensitivity	-139dBm (Min)

Wi-Fi Radio Specifications

Feature	Specifications
Wireless Standard	IEEE 802.11b/g/n
Operating Frequency	ISM band: 2.412~2.472(GHz)
Operation Channels	2.4GHz: 1-13
Transmit Power (The max. power may be different depending on local regulations) -per chain	**802.11b** • 1Mbps: 19dBm • 11Mbps: 19dBm **802.11g** • 6Mbps: 18dBm • 54Mbps: 16dBm **802.11n (2.4G)** • MCS0 (HT20): 18dBm • MCS7 (HT20): 16dBm • MCS0 (HT40): 17dBm • MCS7 (HT40): 15dBm
Receiver Sensitivity (Typical)	**802.11b** • 1Mbps: 95dBm • 11Mbps: 88dBm **802.11g** • 6 Mbps: 90dBm • 54Mbps: 75dBm **802.11n (2.4G)** • MCS0 (HT20): 89dBm • MCS7 (HT20): 72dBm • MCS0 (HT40): 86dBm • MCS7 (HT40): 68dBm

Firmware

Model	Firmware Version	Source
RAK7240 WisGate Edge Prime	WisGateOS V1.0.2	Download

Software

RAK7240 supports different software features such as LoRa, Network, and Management.

Supported Software

LoRa	Network	Management
Supports class A, B, C	CPE and AP mode	WEB Management
Supports LoRaWAN protocol	Bridge, WISP and router module	Supports SSH2
Country code setup	Supports 802.1q backup	Firmware update
TX power up setup	DHCP Server/Client	NTP
Datalogger & statistic	Router module NAT	Supports configure the LoRa Packet Forwarder
Location setup	Firewall	Build-in LoRa Server
Server address and port setup		Supports OpenVPN
		Supports Ping Watch Dog
		Supports MQTT Bridge

Models / Bundles

Part Number	Package Content
RAK7240-0X-14X	1x 8 channel device with LTE module, 1x LoRa Antenna, 2x LTE Antenna, 1x GPS Antenna, 1x 2.4G WiFi Antenna, 1x PoE Injector, 1x Mounting Kit, 1x Manual
RAK7240-1X-14X	1x 16 channel device with LTE module, 2x LoRa Antenna, 1x LTE Antenna, 1x GPS Antenna, 1x 2.4G WiFi Antenna, 1x PoE Injector, 1x Mounting Kit, 1x Manual
RAK7240-0X	1x 8 channel device, 1x LoRa Antenna, 1x GPS Antenna, 1x 2.4G WiFi Antenna, 1x PoE Injector, 1x Mounting Kit, 1x Manual
RAK7240-1X	1x 16 channel device, 2x LoRa Antenna, 1x GPS Antenna, 1x 2.4G WiFi Antenna, 1x PoE Injector, 1x Mounting Kit, 1x Manual

Certification