Product Specification

MerryIoT

Light S1

BROWAN COMMUNICATIONS INC.

Revision History

Revision	Date	Description
1.0	Nov. 26, 2021	1st Release
1.1	Dec. 02, 2021	Platform changed
1.2	Dec. 27, 2021	Platform & specification changed
1.3	Mar. 10, 2022	EMMC capacity changed to 4GB
1.4	Mar. 21, 2022	Active GPS
1.5	Apr. 08, 2022	EMMC & ID changed
1.6	May.03.2022	Add Security Chip Location Photo

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Chapter 1 – Introduction

Purpose

MerryIoT Light S1 is designed for edge computing applications in IoT, Smart Manufacturing, Automation, Blockchain and etc, to support off-load data processing demand.

MerryIoT Light S1 is targeting at AIoT applications with quad A55 cores, G52 GPU hardware, based on Linux distribution. IoT solution providers can easily integrate advanced and stable functions for their application-centric development on their own IoT projects.

Reference

Document	Author
LoRaWAN Regional Parameters	LoRa Alliance
LoRaWAN Specification	LoRa Alliance

Chapter 2 – Hardware Specification

General Specification

No.	Item	Description
1	CPU	- Rockchip **RK3566** - Quad-core Cortex-A55 up to 1.8GHz
2	Memory	- DDR3/4 2GB
3	Storage	- eMMC 8GB
4	LoRa radio	- SX1302+SX1250(x2) or SX1303+SX1250(x2) - External SMA antenna
5	W-Fi radio	- 2.4GHz 1Tx/1Rx 802.11 b/g/n - Built-in antenna
6	BLE radio	- 2.4GHz BLE 5.2 - Built-in antenna
7	GPS	- L1:1575.42±1.023MHz - External SMA antenna with active GPS antenna
8	Crypto chip	- I2C control - Microchip ATECC608A/B in SOIC-8 and UDFN-8
9	LAN interface	- RJ45 10/100Mbps x 1
10	LEDs	- Single colored LED indicator (green) x 4 ■ Power ■ Status ■ System ■ Wi-Fi
11	Reset	- Push button (GPIO)
12	SD card	- Built-in
13	Internal console	- Debug UART on board - USB OTG
14	Environment	- Temp. operating -10°C ~ +50°C ambient - Storage -20°C ~ +70°C ambient - Humidity operating 5%RH ~ 95%RH (non-condensed relative humidity) - Altitude operating 0 ~ 3000 Meters
15	IP ratings	- IP42 (plastic enclosure)
16	Size	- 110x110x30 mm
17	Power	- 12V/2A DC jack - Adapter 12V/1A
Note		

LoRa RF Specification – US915

No.	Item	Description
1	Channels	US915 (known as US902-928)

No.	Item	Description
2	Bandwidth	125KHz/ 500KHz
3	Power	5VDC, 500mA (typical)
4	Antenna	1 ipex connector on board for external antenna
5	Interface	SPI for data communication
6	GPIOs	To control SX1262 (chip select)
7	Form Factor	Mini-PCIe 40 x 50 (w/golden pins) x 3 mm
8	Channel Plan -US915	- **Upstream** (64 channels @ 125KHz BW, starting at 902.3MHz and incrementing linearly by 200KHz to 914.9MHz) Frequency (MHZ) Spreading Factor ■ 902.3 SF7BW125 to SF10BW125 ■ 902.5 SF7BW125 to SF10BW125 ■ 902.7 SF7BW125 to SF10BW125 ■ 902.9 SF7BW125 to SF10BW125 ■ 903.1 SF7BW125 to SF10BW125 ■ 903.3 SF7BW125 to SF10BW125 ■ 903.5 SF7BW125 to SF10BW125 ■ 903.7 SF7BW125 to SF10BW125 ■ 903.9 SF7BW125 to SF10BW125 ■ 904.1 SF7BW125 to SF10BW125 ■ 904.3 SF7BW125 to SF10BW125 ■ 904.5 SF7BW125 to SF10BW125 ■ 904.7 SF7BW125 to SF10BW125 ■ 904.9 SF7BW125 to SF10BW125 ■ 905.1 SF7BW125 to SF10BW125 ■ 905.3 SF7BW125 to SF10BW125 ■ 905.5 SF7BW125 to SF10BW125 ■ 905.7 SF7BW125 to SF10BW125 ■ 905.9 SF7BW125 to SF10BW125 ■ 906.1 SF7BW125 to SF10BW125 ■ 906.3 SF7BW125 to SF10BW125 ■ 906.5 SF7BW125 to SF10BW125 ■ 906.7 SF7BW125 to SF10BW125 ■ 906.9 SF7BW125 to SF10BW125 ■ 907.1 SF7BW125 to SF10BW125 ■ 907.3 SF7BW125 to SF10BW125 ■ 907.5 SF7BW125 to SF10BW125 ■ 907.7 SF7BW125 to SF10BW125 ■ 907.9 SF7BW125 to SF10BW125 ■ 908.1 SF7BW125 to SF10BW125 ■ 908.3 SF7BW125 to SF10BW125 ■ 908.5 SF7BW125 to SF10BW125 ■ 908.7 SF7BW125 to SF10BW125 ■ 908.9 SF7BW125 to SF10BW125 ■ 909.1 SF7BW125 to SF10BW125 ■ 909.3 SF7BW125 to SF10BW125 ■ 909.5 SF7BW125 to SF10BW125 ■ 909.7 SF7BW125 to SF10BW125 ■ 909.9 SF7BW125 to SF10BW125 ■ 910.1 SF7BW125 to SF10BW125

No.	Item	Description
		■ 910.3 SF7BW125 to SF10BW125 ■ 910.5 SF7BW125 to SF10BW125 ■ 910.7 SF7BW125 to SF10BW125 ■ 910.9 SF7BW125 to SF10BW125 ■ 911.1 SF7BW125 to SF10BW125 ■ 911.3 SF7BW125 to SF10BW125 ■ 911.5 SF7BW125 to SF10BW125 ■ 911.7 SF7BW125 to SF10BW125 ■ 911.9 SF7BW125 to SF10BW125 ■ 912.1 SF7BW125 to SF10BW125 ■ 912.3 SF7BW125 to SF10BW125 ■ 912.5 SF7BW125 to SF10BW125 ■ 912.7 SF7BW125 to SF10BW125 ■ 912.9 SF7BW125 to SF10BW125 ■ 913.1 SF7BW125 to SF10BW125 ■ 913.3 SF7BW125 to SF10BW125 ■ 913.5 SF7BW125 to SF10BW125 ■ 913.7 SF7BW125 to SF10BW125 ■ 913.9 SF7BW125 to SF10BW125 ■ 914.1 SF7BW125 to SF10BW125 ■ 914.3 SF7BW125 to SF10BW125 ■ 914.5 SF7BW125 to SF10BW125 ■ 914.7 SF7BW125 to SF10BW125 ■ 914.9 SF7BW125 to SF10BW125 - **Upstream** (8 channels @ 500KHz BW, starting at 903.0MHz and incrementing linearly by 1.6MHz to 914.2MHz) Frequency (MHZ) Spreading Factor ■ 903.0 SF8BW500 ■ 904.6 SF8BW500 ■ 906.2 SF8BW500 ■ 907.8 SF8BW500 ■ 909.4 SF8BW500 ■ 911.0 SF8BW500 ■ 912.6 SF8BW500 ■ 914.2 SF8BW500 - **Downstream** (8 channels @ 500KHz BW, starting at 923.3MHz and incrementing linearly by 600KHz to 927.5MHz) Frequency (MHZ) Spreading Factor ■ 923.3 SF7BW500 to SF12BW500 (RX1) ■ 923.9 SF7BW500 to SF12BW500 (RX1) ■ 924.5 SF7BW500 to SF12BW500 (RX1) ■ 925.1 SF7BW500 to SF12BW500 (RX1) ■ 925.7 SF7BW500 to SF12BW500 (RX1) ■ 926.3 SF7BW500 to SF12BW500 (RX1) ■ 926.9 SF7BW500 to SF12BW500 (RX1) ■ 927.5 SF7BW500 to SF12BW500 (RX1) ■ 923.3 SF12BW500 (RX2)

No.	Item	Description
Note		

LoRa RF Specification – EU868

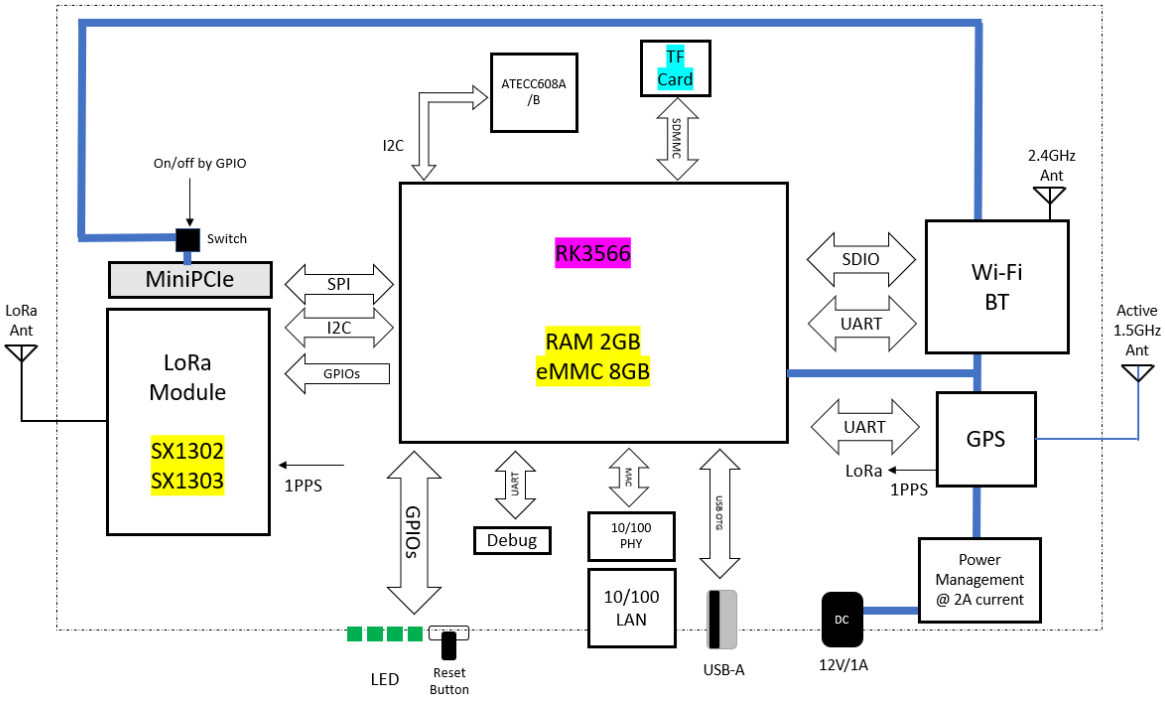
No.	Item	Description
1	Channels	EU868 (known as EU863-870)
2	Bandwidth	125KHz/ 250KHz
3	Power	5VDC, 500mA (typical)
4	Antenna	1 ipex connector on board for external antenna
5	Interface	SPI for data communication
6	GPIOs	To control SX1262 (chip select)
7	Form Factor	- Mini-PCIe 40 x 50 (w/golden pins) x 3 mm
8	Channel Plan -EU868	- **Upstream** Frequency (MHZ) Spreading Factor ■ 868.1 SF7BW125 to SF12BW125 ■ 868.3 SF7BW125 to SF12BW125 and SF7BW250 ■ 868.5 SF7BW125 to SF12BW125 ■ 867.1 SF7BW125 to SF12BW125 ■ 867.3 SF7BW125 to SF12BW125 ■ 867.5 SF7BW125 to SF12BW125 ■ 867.7 SF7BW125 to SF12BW125 ■ 867.9 SF7BW125 to SF12BW125 ■ 868.8 FSK - **Downstream** Frequency (MHZ) Spreading Factor ■ Uplink channels 1-9 (RX1) ■ 869.525 MHz / DR0 (SF12, 125 kHz)
Note		

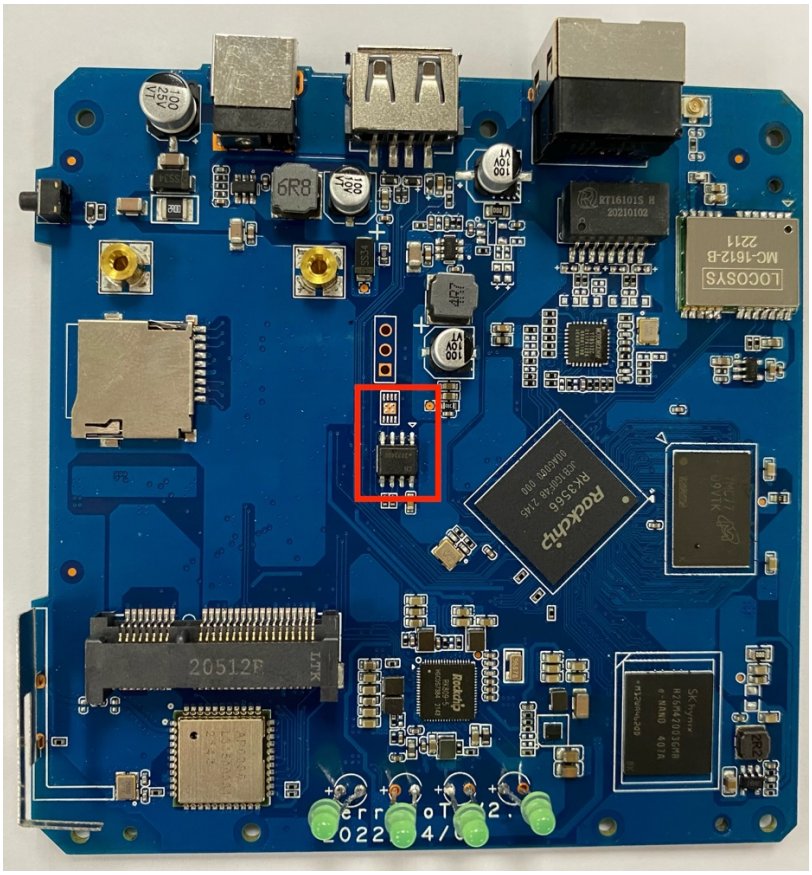
LoRa RF Specification – AS923

No.	Item	Description
1	Channels	- AS923-1 - AS923-2
2	Bandwidth	125KHz/ 250KHz
3	Power	5VDC, 500mA (typical)
4	Antenna	1 ipex connector on board for external antenna
5	Interface	SPI for data communication
6	GPIOs	To control SX1262 (chip select)
7	Form Factor	- Mini-PCIe 40 x 50 (w/golden pins) x 3 mm

No.	Item	Description
8	Channel Plan -AS923-1	- **Upstream** Frequency (MHZ) Spreading Factor ■ 923.2 - SF7BW125 to SF12BW125 ■ 923.4 - SF7BW125 to SF12BW125 ■ 922.2 - SF7BW125 to SF12BW125 ■ 922.4 - SF7BW125 to SF12BW125 ■ 922.6 - SF7BW125 to SF12BW125 ■ 922.8 - SF7BW125 to SF12BW125 ■ 923.0 - SF7BW125 to SF12BW125 ■ 922.0 - SF7BW125 to SF12BW125 ■ 922.1 - SF7BW250 ■ 921.8 - FSK - **Downstream** Frequency (MHZ) Spreading Factor ■ Uplink channels 1-10 (RX1) ■ 923.2 - SF10BW125 (RX2)
9	Channel Plan -AS923-2	- **Upstream** Frequency (MHZ) Spreading Factor ■ 923.2 - SF7BW125 to SF12BW125 ■ 923.4 - SF7BW125 to SF12BW125 ■ 923.6 - SF7BW125 to SF12BW125 ■ 923.8 - SF7BW125 to SF12BW125 ■ 924.0 - SF7BW125 to SF12BW125 ■ 924.2 - SF7BW125 to SF12BW125 ■ 924.4 - SF7BW125 to SF12BW125 ■ 924.6 - SF7BW125 to SF12BW125 ■ 924.5 - SF7BW250 ■ 924.8 - FSK - **Downstream** Frequency (MHZ) Spreading Factor ■ Uplink channels 1-10 (RX1) ■ 923.2 - SF10BW125 (RX2)
Note		

System Diagram



Enclosure (Square Box with Printed Logo)

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