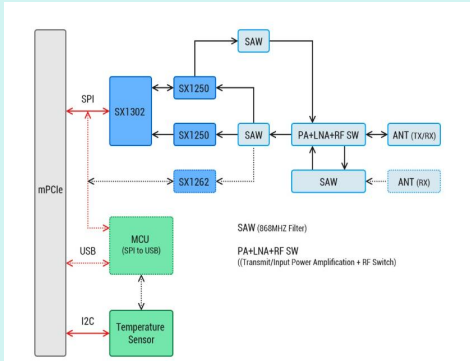
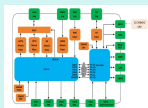
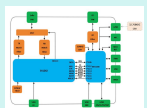
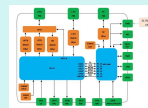
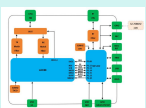
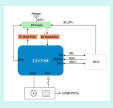
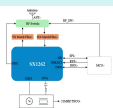
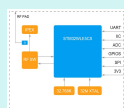


Product	LR1302 LoRaWAN Gateway Module (EU868)		LR1302 LoRaWAN Gateway Module (US915)	
Link	https://www.elecrow.com/lr1302-lorawan-gateway-module-spi-eu868-sx1302-long-range-gateway-module-support-8-channels.html		https://www.elecrow.com/lr1302-lorawan-gateway-module-spi-us915-sx1302-long-range-gateway-module-support-8-channels.html	
Product Image				
Description/Features	•Adopts Semtech® SX1302 baseband LoRa® chip, with ultra - low power consumption and outstanding performance; •The Mini-PCIe form factor and compact design make it easier to integrate into various gateway devices, suitable for space-constrained application scenarios and providing flexible deployment options; •Supports 8 channel data transmission, providing more efficient communication efficiency and capacity; •Ultra-low operating temperature requires no additional cooling, reducing the size of LoRaWAN gateways; •Uses SX1250 TX/RX RF front-end, with sensitivity as low as - 139.5dBm@125K/SF12; •CE, FCC, RoHS certifications simplify the certification process of the final product and facilitate certification;			
Region	EU868		US915	
Frequency Band	863-870MHz		902-928MHz	
Baseband Chip	Semtech SX1302 chip			
RF Front-End	SX1250		SX1250	
Receiver Sensitivity	-125.5dBm @125K/SF7 -139.5dBm @125K/SF12			
Transmit Power	26.5 dBm		25.5 dBm	
Bandwidth	125/250/500 kHz			
Channels	8 channels			
LEDS	Power: Green ,Config: Red ,TX: Green ,RX: Blue			
Form Factor	Mini PCIe, 52 gold pin header			
Spreading Factor	SF7~SF12			
LBT (Listen Before Talk)	None			
Host Interface	SPI			
Power Consumption (SPI version)	Standby: 7.5 mA TX maximum power: 380 mA RX: 38 mA			
Power Consumption (USB version)	Standby: 20.5 mA TX maximum power: 400 mA RX: 54.1 mA			
Antenna Connector	IPEX-1			
Txco	32 MHZ			
Supply Voltage	3.0~3.6V			
Operating Temperature	-30° C to 85° C			
Dimensions	30 mm (width) × 50.95 mm (length)			
Hardware Overview				

Product	nRFLR1110 Wireless Transceiver Module	nRFLR1262 Wireless Transceiver Module	nRFLR1121 Wireless Transceiver Module	nRFLRCC68 Wireless Transceiver Module	LRCC68 Wireless Transceiver Module	LR1262 Wireless Transceiver Module	LR1262 LoRaWAN Node Module
Link	https://www.qorvo.com/design/rf/1110/wireless-transceiver-module-integration-m01110-02-wireless-rf1110-01-hw	https://www.qorvo.com/design/rf/1262/wireless-transceiver-module-integration-m01262-02-wireless-rf1262-01-hw	https://www.qorvo.com/design/rf/1121/wireless-transceiver-module-integration-m01121-02-wireless-rf1121-01-hw	https://www.qorvo.com/design/rf/1cc68/wireless-transceiver-module-integration-m01cc68-02-wireless-rf1cc68-01-hw	https://www.qorvo.com/design/rf/1cc68/wireless-transceiver-module-integration-m01cc68-02-wireless-rf1cc68-01-hw	https://www.qorvo.com/design/rf/1262/wireless-transceiver-module-integration-m01262-02-wireless-rf1262-01-hw	https://www.qorvo.com/design/rf/1262/wireless-transceiver-module-integration-m01262-02-wireless-rf1262-01-hw
Product Image							
Description/Features	• High Performance: Maximum transmit power up to +22dBm; Supports 1.76/62.5kbaud (MLoRa) data rate, -144dBm receive sensitivity, 166dB Link Budget. • Ultra-Low Power Consumption: Standby current as low as 6.9 uA. • Integrated Positioning: Built-in GNSS (GPS/Bellou), Wi-Fi, and Bluetooth for precise indoor/outdoor positioning. • Wireless Support: Compatible with 850/930MHz global LoRa & LoRaWAN ISM frequencies, LoRa Point-to-Point (P2P) communication, Bluetooth 5.x (BLE), and 802.15.4 (Thread/Zigbee, etc). • Developer Friendly: Built-in AT command firmware with SDK support for custom development; AT command set accessible via UART interface. • Long-Range Communication: Communication range up to 10km. • Compact Form Factor: Dimensions only 20x20x3.5 mm. • Certifications: FCC, CE, RoHS certified.	• High Performance: Maximum transmit power up to +22dBm; Supports 0.018/62.5kbaud (MLoRa) data rate, -147dBm receive sensitivity, 170dB Link Budget. • Ultra-Low Power Consumption: Standby current as low as 6.9 uA. • Wireless Support: Compatible with 850/930MHz global LoRa & LoRaWAN ISM frequencies, LoRa Point-to-Point (P2P) communication, Bluetooth 5.x (BLE), and 802.15.4 (Thread/Zigbee, etc). • Developer Friendly: Built-in AT command firmware with SDK support for custom product development; AT command set easily accessible via UART interface. • Long-Range Communication: Communication range up to 10km. • Compact Form Factor: Dimensions only 20 x 20x3.5 mm. • Certifications: FCC, CE, RoHS certified.	• High Performance: Maximum transmit power up to +22dBm; Supports 1.91/62.5kbaud (MLoRa) data rate, -144dBm receive sensitivity, 166dB Link Budget. • Ultra-Low Power Consumption: Standby current as low as 6.9 uA. • Wireless Support: Supports sub-GHz and global 2.4GHz spectrum, S-Band, LoRa Point-to-Point (P2P) communication and wireless connectivity for 850/930MHz global LoRa & LoRaWAN ISM frequencies, Bluetooth 5.x (BLE), and 802.15.4 (Thread/Zigbee, etc). • Developer Friendly: Built-in AT command firmware with support for custom product development using SDK; AT command set easily accessible via UART interface. • Long-Range Communication: Communication range up to 10km. • Compact Form Factor: Dimensions only 20x 20x3.5 mm. • Certifications: FCC, CE, RoHS certified.	• High Performance: Maximum transmit power up to +22dBm; Supports 1.76/62.5kbaud (MLoRa) data rate, -129dBm receive sensitivity, 151dB Link Budget. • Ultra-Low Power Consumption: Sleep current as low as 5.9 uA. • Wireless Support: Compatible with 850/930MHz global LoRa & LoRaWAN ISM frequencies, LoRa Point-to-Point (P2P) communication, Bluetooth 5.x (BLE), and 802.15.4 (Thread/Zigbee, etc). • Long-Range Communication: Transmission range up to 10km. • Developer Friendly: Built-in AT command firmware supports custom product development using SDK; AT command set easily accessible through UART interface. • Compact Form Factor: Dimensions only 20x20x3.5 mm. • Certifications: FCC, CE, RoHS certified.	• High Performance: Maximum transmit power up to +22dBm; Supports 1.76/62.5kbaud data rate, -129dBm receive sensitivity, 151dB Link Budget. • Ultra-Low Power Consumption: Sleep current as low as 1.55 uA. • Frequency Support: Compatible with 850/930MHz global LoRa & LoRaWAN ISM frequencies. • Compact Form Factor: Dimensions only 10x10x2.5 mm. • Certifications: FCC, CE certified.	• High Performance: Maximum transmit power of +22dBm; Supports 0.018/62.5kbaud data rate, -148dBm receive sensitivity, 170dB Link Budget. • Ultra-Low Power Consumption: Sleep current as low as 1.55 uA. • Frequency Compatibility: Operates on 850/930MHz global LoRa&LoRaWAN ISM frequencies. • Compact Form Factor: Dimensions of just 10 X 10 X 2.5 mm. • Certifications: FCC, CE certified.	• High Performance: Maximum transmit power of +22dBm; Supports 0.018/62.5kbaud data rate, -148dBm receive sensitivity, 170dB Link Budget. • Ultra-Low Power Consumption: 1.69 uA in sleep mode. • Frequency Compatibility: Built-in long-range communication protocols supporting comprehensive global frequency planning (150MHz to 960MHz). • Developer Friendly: Built-in AT command firmware with SDK support for customized product development. • Compact Form Factor: 15x15x2.5 mm with 34pin I/O for PCB SMT mounting. • Certifications: FCC, CE certified.
Processor	NRF52840-QIAA-R Processor, Single-core 32 bit,64MHz Main Frequency	NRF52840-QIAA-R Processor, Single-core 32 bit,64MHz Main Frequency	NRF52840-QIAA-R Processor, Single-core 32 bit,64MHz Main Frequency	NRF52840-QIAA-R Processor, Single-core 32 bit,64MHz Main Frequency	None	None	STM32L552C6 (ARM Cortex-M4 32bit, 256KB Flash, 64KB RAM)
Baseband Chip	Semtech LR1110MLTBT chip	Semtech SX1262MLTBT chip	Semtech LR1121MLTBT chip	Semtech LRCC68MLTBT chip	Semtech LRCC68MLTBT chip	Semtech SX1262MLTBT chip	SX1262 (Chip Integration)
Transmit Power	+22 dBmMax	+22 dBmMax	+22 dBmMax	+22 dBmMax	+22 dBmMax	+22 dBmMax	+22 dBmMax
Receiver Sensitivity	-144 dBm	-148 dBm	-144 dBm	-129dBm	-129dBm	-148 dBm	-148 dBm
Link Budget	166db	170db	166db	151db	151db	170db	170db
Demodulator	Support LoRa/(G)FSK/LR-PBSS/Sigfox Modulation	Support LoRa/(G)FSK Modulation	Support LoRa/(G)FSK/LR-PBSS/Sigfox Modulation	Support LoRa/(G)FSK Modulation	Support LoRa/(G)FSK Modulation	Support LoRa/(G)FSK Modulation	Support LoRa/(G)FSK/(G)MSK, BPSK Modulation
LoRa Frequency Range	Supports 150MHz ~ 960MHz Frequency Band Configuration	Supports 150MHz ~ 960MHz Frequency Band Configuration	Supports 150MHz ~ 960MHz Frequency Band Configuration	Supports 150MHz ~ 960MHz Frequency Band Configuration	Supports 150MHz ~ 960MHz Frequency Band Configuration	Supports 150MHz ~ 960MHz Frequency Band Configuration	Supports 150MHz ~ 960MHz Frequency Band Configuration
Frequency	868/915 MHz	868/915 MHz	868/915 MHz	868/915 MHz	868/915 MHz	868/915 MHz	868/915 MHz
Spreading Factor	SF5~SF12	SF5~SF12	SF5~SF12	SF5~SF11	SF5~SF11	SF5~SF12	SF5~SF12
Wireless Connection	Bluetooth 5.x (BLE), 802.15.4 (Thread/Zigbee, etc)	Bluetooth 5.x (BLE), 802.15.4 (Thread/Zigbee, etc)	Bluetooth 5.x (BLE), 802.15.4 (Thread/Zigbee, etc)	Bluetooth 5.x (BLE), 802.15.4 (Thread/Zigbee, etc)	/	/	/
Data Transfer Rate	0.076/62.5kbaud	0.018/62.5kbaud	0.091/62.5kbaud	1.76/62.5kbaud	1.76/62.5kbaud	0.018/62.5kbaud	0.018/62.5kbaud
Communication Interface	SPI (0~10Mbps)	SPI (0~10Mbps)	SPI (0~10Mbps)	SPI (0~10Mbps)	SPI (0~10Mbps)	SPI (0~10Mbps)	I2C/SPI
Pin	80 Pin	80 Pin	80 Pin	80 Pin	24 Pin	24 Pin	34 Pin
Antenna	Not integrated, via RF pins	Not integrated, via RF pins	Not integrated, via RF pins	Not integrated, via RF pins	Not integrated, via RF pins	Not integrated, via RF pins	Not integrated, via RF pins
Power Consumption	6uA (sleep), 12mA (transmit + MCO), 18mA (receive + MCO) 8uA @Bluetooth Scan, 8uA @RF1 Scan	5uA (sleep), 12mA (transmit + MCO), 12mA (receive + MCO)	6uA (sleep), 12mA (transmit + MCO), 18mA (receive + MCO)	5uA (sleep), 12mA (transmit + MCO), 12mA (receive + MCO)	1.5uA (sleep), 120mA (transmit + MCO), 7.5mA (receive + MCO)	1.55uA (sleep), 121mA (transmit + MCO), 7.3mA (receive + MCO)	1.69 uA (sleep), 87 mA (transmit), 5.2mA(receive)
Communication Distance	5 ~ 6 km, maximum up to 15 km	5 ~ 6 km, maximum up to 15 km	5 ~ 6 km, maximum up to 15 km	4 ~ 5 km, maximum up to 10 km	4 ~ 5 km, maximum up to 10 km	5 ~ 6 km, maximum up to 15 km	5 ~ 6 km, maximum up to 15 km
LoRaWAN Protocol	Support	Support	Support	Support	Support	Support	Support
Operating Voltage	1.8~3.7V	1.8~3.7V	1.8~3.7V	1.8~3.7V	1.8~3.7V	1.8~3.7V	2.2~3.6V
Operating Temperature	-30℃~+85℃	-30℃~+85℃	-30℃~+85℃	-30℃~+85℃	-30℃~+85℃	-30℃~+85℃	-30℃~+85℃
Package Dimensions	20x20x3.5mm, 80Pin,SMT package, LGA package	20x20x3.5mm, 80Pin,SMT package, LGA package	20x20x3.5mm, 80Pin,SMT package, LGA package	20x20x3.5mm, 80Pin,SMT package, LGA package	10x10x2.5mm, 24Pin, SMT mounting, castellated holes, board thickness 1 mm, pitch 1.27 mm	10x10x2.5mm, 24pin, SMT mounted castellated hole design	15x15x2.5mm, 34pin, SMT mounted, castellated holes
Weight	3g	3g	3g	3g	1g	1g	3g
Txrx	32 MHz	32 MHz	32 MHz	32 MHz	32 MHz	32 MHz	32 MHz
Hardware Overview							
Product Application	ThinkNode M3	ThinkNode M6					LR1262 Node Development Board, Cortusail- LoRaTAH, LR1262 Development Board, ThinkNode M1