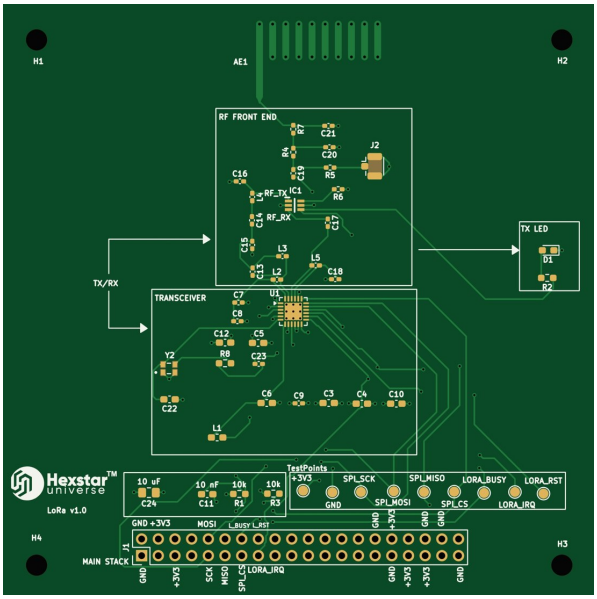
COM · LoRa Radio

Long-range telemetry and command link

Overview

The communications board sits at the top of the stack. A Semtech SX1262 transceiver sends telemetry packets to the Hexstar ground station and listens for commands. A PE4259 RF switch shares one antenna between transmit and receive, a TCXO keeps the carrier on frequency across temperature, and a hand-tuned matching network couples the radio to the 868 MHz whip on the top plate.



Key features

- Semtech SX1262 LoRa transceiver, up to +22 dBm
- PE4259 SPDT RF switch for TX / RX
- 32 MHz TCXO frequency reference
- Discrete harmonic filter and 50 Ω matching network
- U.FL output to the top-plate whip, plus a printed backup antenna
- Internal DC-DC mode for low receive current
- TX activity LED

Specifications

Transceiver	Semtech SX1262
Band	868 MHz ISM (region-tunable)
TX power	Up to +22 dBm
Interface	SPI + BUSY / DIO1 / RESET via the stack
Antenna	U.FL to whip; PCB backup antenna
Board	90 × 90 mm, 1.6 mm FR4

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Bill of materials

Fitted parts only. Do-not-populate (DNP) options are omitted.

Ref	Qty	Value	Description	Package	Manufacturer · MPN
U1	1	SX1262	LoRa transceiver 150-960 MHz, +22 dBm	QFN-24 4x4 mm	Semtech SX1262IMLTRT
IC1	1	PE4259-63	SPDT RF switch 10-3000 MHz, single-pin control	SC-70-6	pSemi (Murata) PE4259-63
Y2	1	32 MHz TCXO	TCXO 32 MHz, +/-0.5 ppm, clipped sine, 1.7-3.6 V	2.0 x 1.6 mm 4-SMD	ECS Inc. ECS-TXO-20CSMV4-320-AY-TR
L1	1	15 uH	SX1262 DC-DC inductor	0603	TDK MLZ1608N150LT000
L2	1	47 nH	PA supply choke, VR_PA to RFO	0402	Murata LQW15AN47NG80D
L3	1	2.2 nH	TX notch inductor	0402	Murata LQW15AN2N2G80D
L4	1	9.1 nH	TX filter series inductor	0402	Murata LQW15AN9N1G80D
L5	1	15 nH	RX balun inductor	0402	Murata LQW15AN15NG80D
C18	1	1.8 pF	RX balun shunt, RFI_P to GND	0402 C0G 50 V	YAGEO AC0402BRNPO9BN1R8
C17	1	2.4 pF	RX balun series, RFI_N to RF_RX	0402 C0G 50 V	YAGEO AC0402BRNPO9BN2R4
C16	1	3 pF	TX filter shunt at switch RF1	0402 C0G 50 V	YAGEO AC0402BRNPO9BN3R0
C13	1	3.3 pF	TX notch capacitor across L3	0402 C0G 50 V	YAGEO AC0402BRNPO9BN3R3
C15	1	8.2 pF	TX filter shunt	0402 C0G 50 V	YAGEO AC0402BRNPO9BN8R2
C23	1	10 pF	TCXO output coupling to XTA	0402 C0G 50 V	YAGEO AC0402FRNPO9BN100
C14, C19	2	39 pF	DC blocks: TX path and switch RFC	0402 C0G 50 V	YAGEO AC0402FRNPO9BN390
C8	1	47 pF	VR_PA RF decoupling	0402 C0G 50 V	YAGEO AC0402JRNPO9BN470
C9	1	10 nF	VBAT decoupling	0402 X7R 50 V	YAGEO CC0402KRX7R9BB103
C7	1	47 nF	VR_PA decoupling	0402 X7R 25 V	YAGEO AC0402KRX7R8BB473
C11	1	10 nF	LORA_RST filter	0603 X7R 50 V	YAGEO CC0603KRX7R9BB103
C3, C4, C5, C10, C12, C22	6	100 nF	3V3 and TCXO decoupling	0603 X7R 50 V	YAGEO CC0603KRX7R9BB104
C6	1	470 nF	VREG decoupling	0603 X7R 16 V	YAGEO CC0603KRX7R7BB474
C24	1	10 uF	3V3 bulk at stack connector	0805 X5R 25 V	Samsung CL21A106KAYNNNE
R4, R7	2	0R	Antenna path links	0402	YAGEO AC0402FR-070RL

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Ref	Qty	Value	Description	Package	Manufacturer · MPN
R6	1	1k	RF switch VDD feed	0402 1%	YAGEO AC0402FR-7W1KL
R1, R3	2	10k	RST and CS pull-ups	0603 1%	YAGEO RC0603FR-0710KL
R2	1	1k	LED series resistor	0603 1%	YAGEO RC0603FR-071KL
R8	1	220R	TCXO output series resistor	0603 1%	YAGEO RC0603FR-07220RL
D1	1	Green LED	TX status LED (DIO2)	0603	Lite-On LTST-C191KGKT
J2	1	U.FL	RF test receptacle	U.FL SMT vertical	Hirose U.FL-R-SMT-1(10)
J1	1	2x20 header	MAIN STACK connector, 2.54 mm, mates with OBC J4	2x20 THT 2.54 mm	Samtec TSW-120-07-G-D

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