SX1262 vs SX1276: Why It Matters

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The two most common LoRa radio ICs from Semtech in mesh nodes today are the older SX1276 (SX127x family) and the newer SX1262, though newer boards may instead use the LR1110/LR1121 or the 2.4 GHz SX1280. Both the SX1276 and SX1262 implement LoRa spread-spectrum modulation and are outwardly similar, but their performance characteristics and firmware support differ in ways that matter to operators making purchasing decisions.

SX1276 -- The Legacy Chip

The SX1276 was Semtech's main LoRa transceiver through most of the 2010s and became the default radio in the first wave of Meshtastic hardware. It supports 433, 868, and 915 MHz bands via separate variants. Key specs:

- Receive sensitivity: ~-137 dBm at SF12, BW125 (the headline ~-148 dBm figure applies only at the narrowest bandwidth)
- Max output power: +20 dBm via the PA_BOOST path (+17 dBm on the RFO path); most 868/915 MHz Meshtastic boards use the +20 dBm PA_BOOST output
- No dedicated hardware Channel Activity Detection (CAD) of the kind the SX126x family added
- Wider support across early Meshtastic board designs

Boards using SX1276: T-Beam v0.7, v1.0, v1.1; Heltec LoRa 32 V1 and V2; original TTGO LoRa boards.

SX1262 -- The Current Standard

The SX1262 is Semtech's second-generation LoRa transceiver and is now the standard chip in nearly all modern mesh hardware. Improvements over SX1276:

- Receive sensitivity: ~-137 dBm at SF12, BW125 -- essentially the same as the SX1276 at the same SF/BW (both datasheets quote ~-148 dBm only at their narrowest bandwidth). At a given SF/BW the two chips are within roughly 1-3 dB of each other
- Max output power: +22 dBm (vs +20 dBm)
- Hardware Channel Activity Detection (CAD) -- the chip can listen for LoRa preambles and avoid transmitting when the channel is busy, reducing packet collisions
- Lower RX current draw and TCXO-based frequency stability, giving a slightly better overall link budget

Boards using SX1262: T-Beam v1.2 and Supreme; RAK4631 WisBlock (all variants); Heltec LoRa 32 V3; LILYGO T-Deck; Heltec Mesh Node T114; T3-S3.

MeshCore Chip Support

In practice, MeshCore targets SX126x-class radios and the great majority of MeshCore hardware uses the SX1262. MeshCore does, however, support SX1276/SX127x variants as well, so an SX1262 is not a hard requirement. If you are buying hardware specifically for MeshCore, SX1262-equipped boards are the most widely supported choice; check the MeshCore supported-hardware list for the specific board you intend to use.

Meshtastic supports both chips, though official guidance now flags the older SX127x boards as phased out and not recommended for new purchases.

Practical Range Impact

At the same spreading factor and bandwidth, the SX1262 and SX1276 have very similar receive sensitivity (within about 1-3 dB), so swapping chips does not by itself produce a large range increase. The SX1262's real advantages are its lower RX current draw, TCXO stability, hardware CAD, and a slightly better overall link budget. Real-world range in any deployment is dominated by antenna gain, height, line of sight, and local noise -- not by the choice between these two chips.

Quick Reference: Which Board Has Which Chip

Board	Chip	MeshCore Compatible
T-Beam v0.7 / 1.0 / 1.1	SX1276	Yes (SX127x supported)
T-Beam v1.2 / Supreme	SX1262	Yes
RAK4631 (all)	SX1262	Yes
Heltec V1 / V2	SX1276	Yes (SX127x supported)

Heltec V3	SX1262	Yes
T-Deck	SX1262	Yes
T114	SX1262	Yes
T3-S3	SX1262 variant (also sold with SX1276 / LR1121 / SX1280)	Yes

When purchasing used or surplus hardware, always verify the board version before assuming SX1262. Many T-Beams sold on secondary markets are pre-v1.2 and carry the SX1276. Check the silkscreen on the radio module or the board revision printed near the USB port.

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