xTRX2(HR)-PA Operational Description:

The xTRX2(HR)-PA module is a short range, low power, 2,4GHz ISM band transceiver module using the Ember™ EM250 or STM SN250 single chip solution for ZigBee™, a IEEE802.15.4- compliant transceiver with a 16-bit XAP2b microprocessor plus an additional 2.4GHz power amplifier from NEC (UPG2314T5N) is included in the module.

With added onboard reference oscillators and optimized RF frontend circuitry xTRX2(HR)-PA provides the complete hardware needed for a ZigBee™ class 1 solution. ETRX2(HR)-PA comprises EmberZNet, the Ember™ ZigBee–compliant software stack, which is a ZigBee™ profile-ready platform compliant solution. A reliable Application Programming Interface based on the ZigBee™ specification is provided for the ease of the creation of application profiles.
Same software is also possible from ST Microelectronics (STM) for the versions STRX2-PA [version with ceramic antenna] and STRX2HR-PA [version with plug connector].

The RF system itself, follows the IEEE802.15.4 standard.

xTRX2(HR)-PA Tuning Procedure:

The xTRX2(HR)-PA module is a short range, low power, 2,4GHz ISM band transceiver module using the Ember™ EM250 or ST Microelectronics SN250 single chip solution for ZigBee™, a IEEE802.15.4- compliant transceiver with a 16-bit XAP2b microprocessor plus an additional 2.4GHz power amplifier from NEC (UPG2314T5N) is included in the module.

Tuning procedure for channel accuracy is not applicable, the crystal tolerance and the capacitor values are in the ZigBee™ accuracy for ±40ppm.

The RF system itself, follows the IEEE802.15.4 standard:
IEEE Standard 802.15.4 –2003 Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (LR-WPANs)

The channel selection must follow the above standard, here are some information, copied from this standard:

6.1.1 Operating frequency range

A compliant device shall operate in one or several frequency bands using the modulation and spreading formats summarized in Table 1.

Table 1—Frequency bands and data rates

PHY (MHz)	Frequency band (MHz)	Spreading parameters		Data parameters		
		Chip rate (kchip/s)	Modulation	Bit rate (kb/s)	Symbol rate (ksymbol/s)	Symbols
868/915	868–868.6	300	BPSK	20	20	Binary
	902–928	600	BPSK	40	40	Binary
2450	2400–2483.5	2000	O-QPSK	250	62.5	16-ary Orthogonal

This standard is intended to conform with established regulations in Europe, Japan, Canada, and the United States. The regulatory documents listed below are for information only and are subject to change and revisions at any time. IEEE 802.15.4 devices shall also comply with specific regional legislation. Additional regulatory information is provided in Annex F.

6.1.2 Channel assignments and numbering

A total of 27 channels, numbered 0 to 26, are available across the three frequency bands. Sixteen channels are available in the 2450 MHz band, 10 in the 915 MHz band, and 1 in the 868 MHz band. The center frequency of these channels is defined as follows:

$F_c = 868.3$ in megahertz, for $k = 0$

$F_c = 906 + 2\,(k - 1)$ in megahertz, for $k = 1, 2, ..., 10$

and $F_c = 2405 + 5\,(k - 11)$ in megahertz, for $k = 11, 12, ..., 26$

where

k is the channel number.

For each PHY supported, a compliant device shall support all channels allowed by regulations for the region in which the device operates.

The channel selection are done by the OEM manufacturer.