ZigBee (IEEE 802.15.4)

Frequency range	Modulation	Multiple access	Duplex	Channel bandwidth	Number of channels	Peak data rate
2.4 GHz to 2.4835 GHz (World) 902 MHz to 928 MHz (America) 868.3 MHz (Europe)	BPSK (868/915 MHz), OQPSK (2.4 GHz)	CSMA/CA	TDD	5 MHz	1 (868 MHz) 10 (915 MHz) 16 (2.4 GHz)	20 kbit/s (868 MHz) 40 kbit/s (915 MHz) 250 kbit/s (2.4 GHz)

Selected products

R&S®SMJ 100A

With its ARB generator, the R&S®SMJ 100A can generate any type of waveform including, of course, ZigBee signals.

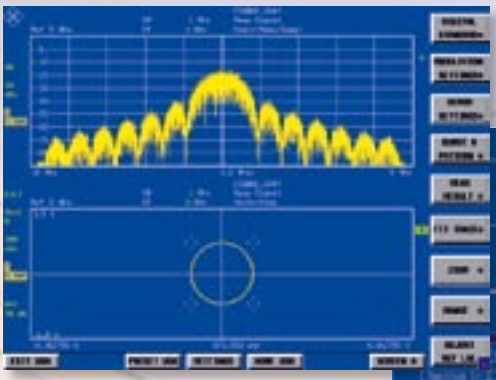
R&S®FSQ

Not all analyzers are able to demodulate ZigBee-specific OQPSK signals, which requires an unusual filter characteristic. With the R&S FS-K70 option, this is no problem for the R&S®FSQ.

Application notes	
Title	**Designation**
OQPSK Measurements	1EF55

ZigBee measurement solutions

	Recommended products	Features/measurements
Signal generation	• **Signal Generator R&S®SMU 200A** or • **Signal Generator R&S®SMJ 100A** or • **Signal Generator R&S®SMATE 200A**	• Frequency range 100 kHz to 6 GHz • Internal I/Q modulation bandwidth 80 MHz (at RF) • Arbitrary waveform generator with 64 Msamples • Up to two signal generators in one box (e.g. useful signal + interferer, R&S®SMU 200A and R&S®SMATE 200A), both up to 6 GHz in the R&S®SMATE 200A • Fading simulator (option) with up to 40 fading paths (R&S®SMU 200A) • Extremely fast setting times and addressable list mode for production (R&S®SMATE 200A)
Signal analysis	• **Signal Analyzer R&S®FSQ + R&S®FSQ-K70 software option**	• EVM • I/Q imbalance • Demodulated bits • Power measurements
	• **Handheld Spectrum Analyzer R&S®FSH 3/6**	• Frequency range 100 kHz to 3 GHz / 6 GHz • Internal preamplifier • Displayed average noise level typ. –135 dBm (RBW 100 Hz) • Level accuracy typ. 0.5 dB • Resolution bandwidths 100 Hz to 1 MHz, one and three steps • Wide range of detectors: sample, max/min peak, auto peak, RMS



Spectrum and vector diagram of a ZigBee signal, measured with the Signal Analyzer R&S®FSQ.

EVM measurement on a ZigBee modulation generated with the Signal Generator R&S®SMJ 100A. The very low residual EVM of <0.3 % is a prerequisite for accurate EVM measurements.