

IoT Networks

ISM Band

ISM Band

❖ ISM Frequency Band

- ISM (Industrial, Scientific and Medical) bands are RF (Radio Frequency) bands reserved internationally for the use of industrial, scientific, and medical purposes
- ITU Radio Regulations (article 5) footnotes 5.138, 5.150, and 5.280
 - Frequency band, spectrum, and transmission power regulations apply

ISM Band

❖ ISM Band Interference

- Devices operating in the 2.4 GHz range include
 - Wi-Fi
 - Bluetooth
 - IEEE 802.15.4 devices: ZigBee, 6LoWPAN, etc.
 - Cordless telephones
 - Amateur radio equipment
 - Microwave ovens
 - Baby monitors
 - etc.

ISM Band

❖ ISM Frequency Band

- Devices using ISM bands will experience various types of interference
 - Same protocol & product types
 - Wi-Fi device ↔ Wi-Fi device
 - Other protocol & product types
 - Wi-Fi ↔ Bluetooth ↔ ZigBee
 - Radiation from other machines/equipment
 - Microwave Oven ↔ Wi-Fi

ISM Band

Frequency range		Bandwidth	Center Frequency	Availability
6.765 MHz	6.795 MHz	30 kHz	6.780 MHz	Subject to local acceptance
13.553 MHz	13.567 MHz	14 kHz	13.560 MHz	Worldwide
26.957 MHz	27.283 MHz	326 kHz	27.120 MHz	Worldwide
40.660 MHz	40.700 MHz	40 kHz	40.680 MHz	Worldwide
433.050 MHz	434.790 MHz	1.74 MHz	433.920 MHz	local acceptance
902.000 MHz	928.000 MHz	26 MHz	915.000 MHz	local acceptance
2.400 GHz	2.500 GHz	100 MHz	2.450 GHz	Worldwide

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Frequency range		Bandwidth	Center Frequency	Availability
5.725 GHz	5.875 GHz	150 MHz	5.800 GHz	Worldwide
24.000 GHz	24.250 GHz	250 MHz	24.125 GHz	Worldwide
61.000 GHz	61.500 GHz	500 MHz	61.250 GHz	Subject to local acceptance
122.000 GHz	123.000 GHz	1 GHz	122.500 GHz	Subject to local acceptance
244.000 GHz	246.000 GHz	2 GHz	245.000 GHz	Subject to local acceptance

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References

References

- Wi-Fi Alliance, <http://www.wi-fi.org>
- Bluetooth SIG, <http://www.bluetooth.org>
- Wikipedia, <http://www.wikipedia.org>
- E. Ferro and F. Potorti, "Bluetooth and Wi-Fi wireless protocols: a survey and a comparison," IEEE Wireless Communications, vol. 12, no. 1, pp. 12-26, Feb. 2005.