



Protocol	Frequency	Security	Type	Power	Speed	Range	Mesh	Chip	Module	Note
6LowPAN / Thread	2.4 GHz	AES-128	Mesh	Low	250 Kbps	100m	Yes	nRF52840	BT840	Low power, low data
Bluetooth Classic	2.4 GHz	8 - 128 bits	Peer-to-peer	Moderate	2-3 Mbps	50m	No	-	-	Streaming music
Bluetooth LE	2.4 GHz	AES-128	Mesh	Low	1 Mbps	50m	32,767	nRF52832	BT832	Ultralow power, intermitten small data
Bluetooth 5	2.4 GHz	AES-128	Mesh	Low	2-3 Mbps	50m	32,767	nRF52832	BT832	Bluetooth 5 combines Bluetooth Classic and BLE into single solution
GSM/GPRS	850 MHz / 1.9 GHz	64-bit A5/1	Cellular Network	High	Moderate	35 km	No	-	SIM800	Cellular voice/data. Being phased out, and not recommended for new designs.
LoRa / LoRaWAN	868 MHz / 915 MHz	AES-128	LPWAN	Low	27 kbps	10km+	No	SX1276	RAK811	Long range / low speed / low power
LTE	Various	3GPP (128 - 256 bit)	Cellular	High	100+ Mbps	20km+	No	-	SIM7500	Cellular highspeed data. Expensive.
LTE-M	Various	3GPP (128 - 256 bit)	Cellular	Moderate	1 Mbps	20km+	No	-	SIM7000A	Lower latency than NB-IoT. Double the module cost of NB-IoT. Latency = 50 to 100 ms.
NB-IOT	Various	3GPP (128 - 256 bit)	Cellular	Low	250kps	20km+	No	-	SIM7020	Narrowband cellular technology. Also called LTE-NB. Latency = 1.5 to 10 seconds.
NFC	13.56 MHz	-	Peer-to-peer	Low	424 Kbps	Inches	No	-	-	Inductive coupling, not RF
WiFi	2.4 GHz / 5 GHz	WEP, WPA, WPA2 (AES)	Access point	Moderate	250+ Mbps	100m+	No	ESP32	ESP32-WROOM	Requires access point.
WiFi Direct	2.4 GHz / 5 GHz	WEP, WPA, WPA2 (AES)	Peer-to-peer	Moderate	250 Mbps	100m+	No	ESP32	ESP32-WROOM	WiFi Direct is peer-to-peer similar to Bluetooth Classic
ZigBee	915MHz / 2.4 GHz	AES-128	Mesh	Low	250 Kbps	100m	65,000	nRF52840	BT840	Primarily for home automation
Z-Wave	868/908 MHz	Triple DES	Mesh	Low	100 Kbps	150m	232	SD3502	ZM5202	Proprietary. Larger range than ZigBee, but slower. Less crowded RF band.