LoRa and LoRaWAN Timing

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LoRa (**Lo**ng-**Ra**nge) is digital wireless data communication IoT technology. LoRa transmits over license-free megahertz radio frequency bands: 169 MHz, 433 MHz (Asia), 868 MHz (Europe) and 915 MHz (North America). LoRa enables very-long-range wireless data transmission. LoRa communications can be made at ranges of ten miles or more in rural areas, using low power. LoRa can achieve this by narrowing the bandwidth.

The laws of physics dictate that in order to transmit over a longer distance, you either need to increase the power or reduce the bandwidth. For more information on LoRa technology follow this link.

Contingent on the configuration of your LoRa radios and how many nodes and gateways you will use, you will need one or more clocks at different frequencies and stabilities. ECS Inc. has many products specifically engineered to meet these requirements. Listed below are some of the more commonly used clocks in LoRa applications. If you have special requirements, we have many other solutions to help complete the Long-Range wireless network.

Clocks for LoRa and LoRaWAN

32.768 kHz Crystals

Part Number	Frequency	Load Capacitance	Package Size
ECS-.327-12.5-1210-TR	32.768 kHz	12.5 pF	1.2 x 1.0 mm
ECS-.327-12.5-16-TR	32.768 kHz	12.5 pF	1.6 x 1.0 mm
ECS-.327-12.5-12-TR	32.768 kHz	12.5 pF	2.0 x 1.2 mm
ECS-.327-12.5-34B-TR	32.768 kHz	12.5 pF	3.2 x 1.5 mm

32 MHz Crystals

Part Number	Frequency	Load Capacitance	Package Size
ECS-320-10-48-CKY-TR	32 MHz	10 pF	1.2 x 1.0 mm
ECS-320-8-47-CKM-TR	32 MHz	8 pF	1.6 x 1.2 mm
ECS-320-8-37CKM-TR	32 MHz	8 pF	2.0 x 1.6 mm
ECS-320-10-36-CTN-TR	32 MHz	10 pF	2.5 x 2.0 mm
ECS-320-8-33-RWM-TR	32 MHz	8 pF	3.2 x 2.5 mm

32.768 kHz Oscillators

Part Number	Frequency	Tolerance	Voltage	Package Size
ECS-327MV-CN-TR	32.768 kHz	25 ppm	1.6V ~ 3.6V	1.6 x 1.2 mm

32 MHz Oscillators

Part Number	Frequency	Tolerance	Voltage	Package Size
ECS-1612MV-320-CN-TR	32 MHz	25 ppm	1.6V ~ 3.6V	1.6 x 1.2 mm
ECS-2016MV-320-CN-TR	32 MHz	25 ppm	1.6V ~ 3.6V	2.0 x 1.6 mm
ECS-2520MV-320-BN-TR	32 MHz	25 ppm	1.6V ~ 3.6V	2.5 x 2.0 mm
ECS-3225MV-320-BN-TR	32 MHz	25 ppm	1.6V ~ 3.6V	3.2 x 2.5 mm

52 MHz Oscillators

Part Number	Frequency	Tolerance	Voltage	Package Size
ECS-1612MV-520-CN-TR	52 MHz	25 ppm	1.6V ~ 3.6V	1.6 x 1.2 mm
ECS-2016MV-520-CN-TR	52 MHz	25 ppm	1.6V ~ 3.6V	2.0 x 1.6 mm
ECS-2520MV-520-BN-TR	52 MHz	25 ppm	1.6V ~ 3.6V	2.5 x 2.0 mm
ECS-3225MV-520-BN-TR	52 MHz	25 ppm	1.6V ~ 3.6V	3.2 x 2.5 mm

32.768 kHz TCXO

Part Number	Frequency	Tolerance	Package Size
ECS-327TXO-33-TR	32.768 kHz	1.5 ppm	3.2 x 2.5 mm

32 MHz TCXO

Part Number	Frequency	Tolerance	Package Size
ECS-TXO-2016-33-320-TR	32 MHz	2.5 ppm	2.0 x 1.6 mm
ECS-TXO-2520-33-320-AN-TR	32 MHz	2.5 ppm	2.5 x 2.0 mm

52 MHz TCXO

Part Number	Frequency	Tolerance	Package Size
ECS-TXO-2016-33-520-TR	52 MHz	2.5 ppm	2.0 x 1.6 mm
ECS-TXO-2520-33-520-AN-TR	52 MHz	2.5 ppm	2.5 x 2.0 mm

32 MHz TCXO – Clipped Sine Wave

Part Number	Frequency	Tolerance	Package Size
ECS-TXO-20CSMV4-320-AY-TR	32 MHz	0.5 ppm	2.0 x 1.6 mm
ECS-TXO-20CSMV-320-EY-TR	32 MHz	2.5 ppm	2.0 x 1.6 mm
ECS-TXO-25CSMV-320-DY-TR	32 MHz	2.0 ppm	2.0 x 1.6 mm

52 MHz TCXO – Clipped Sine Wave

Part Number	Frequency	Tolerance	Package Size
ECS-TXO-20CSMV4-520-AN-TR	52 MHz	0.5 ppm	2.0 x 1.6 mm

LoRaWAN is a wireless data collection protocol, specifically designed for gathering low bandwidth sensors over long distances. It's used as a portal for industrial, medical and municipal data gathering. This will help simplify time consuming tasks and drive a connected world. For more information about LoRaWAN follow this link.

ECS Inc. is committed to supplying high end electronic components to help you Engineer the IoT connected world. For more information on ECS Inc products click here.