

Radar Systems Market

Forecasted to grow from \$34.4 Bn in 2023 to \$47.5 Bn in 2030. A CAGR of 4.7% YoY.



Description

- RADAR Systems use radio waves to detect the presence, location, and movement of objects. A typical system measures the time between the transmitted and received signals to determine the object's distance.
- Commercial aircraft use RADAR for weather detection and avoidance, terrain avoidance, and navigation. Air Traffic Control (ATC) uses radar to monitor aircraft in the nearby airspace.
- In the defense industry RADAR Systems are mounted onto aircraft, vehicles, and as ground-based systems. Uses include air defense, aerial surveillance, naval navigation, object identification, and UAV (Unmanned Aerial Vehicle) coordination.
- Advanced radar systems can include Doppler Radar whereby relative object velocity is measured from the frequency shift of the returned signal, multiple object detection, pulse compression, use of Artificial Intelligence (AI), and fusion with other sensors.
- Solid-State Radar Systems are equipped with a phased-array antenna allowing the RADAR's radiation to be digital beamformed using software commands to electronically controlled phase shifters, mitigating the need for any physical movement of the antenna.
- It is important to have a high-quality oscillator in the RF electronics design to achieve a high-performance Radar System.

Drivers

- Increase in the number of defense projects.
- Demand for advanced weather monitoring.
- Advances in technology is making more applications possible.

Customer Challenges & Opportunities

- The demand for advanced features, higher resolution, multiple object detection, and longer range is an opportunity for Ultra-Low Phase Noise OCXOs.

Description & Requirements	Frequency & Timing Control	RF & Antenna	Power & Magnetics
Local Oscillator (RF RADAR – 1GHz... 40GHz)	<u>Ultra-Low Phase Noise OCXOs (VCOCXOs)</u> O-CS8 (21.8 x 14.0mm, 100MHz) O-CE-x0S (36.0 x 27.0mm, 10MHz) <u>OCXOs</u> AOCJYR (9.7 x 7.5mm) AOC1409 (14.9 x 9.7mm) AOC2012 (20.32 x 12.7mm)	N/A	N/A
Local Oscillator (Low-frequency RADAR <1GHz)	<u>Ultra-Low Phase Noise OCXOs (VCOCXOs)</u> O-CS8 (21.8 x 14.0mm, 100MHz) O-CE-x0S (36.0 x 27.0mm, 10MHz) <u>OCXOs</u> AOCJYR (9.7 x 7.5mm) AOC1409 (14.9 x 9.7mm) AOC2012 (20.32 x 12.7mm) <u>Crystal Oscillator</u> ASATDV (2.0 x 1.6mm) ASDTDV (2.5 x 2.0mm) ASETDV (3.2 x 2.5mm)	N/A	N/A
Frequency Synthesizer reference	<u>ClearClock® (Differential output crystal oscillators)</u> AK2 (2.5 x 2.0mm) AK5 (5.0 x 3.2mm) AK7 (7.0 x 5.0mm)	N/A	N/A
Crystal for Microprocessor / FPGA	<u>ClearClock® (Differential output crystal oscillators)</u> AK2B/AK3B (2.5 x 2.0mm) AX3 (3.2 x 2.5mm) AX5 (5.0 x 3.2mm) AX7 (7.0 x 5.0mm) <u>MHz Crystals (Auto-Grade)</u> ABM8AIG (3.2 x 2.5mm) ABM10AIG (2.5 x 2.0mm) ABM11AIG (2.0 x 1.6mm)	N/A	N/A

Description & Requirements	Frequency & Timing Control	RF & Antenna	Power & Magnetics
DC-DC/Isolated Power Supply	<u>Crystal Oscillator</u> ASADV (2.0 x 1.6mm) ASDDV (2.5 x 2.0mm) ASEDV (3.2 x 2.5mm)	N/A	<u>Mid-High Power Inductors</u> AMDLA (Molded Round Wire) AMPLA (Molded Round Wire) ASPIAIG-F (Molded Flat Wire) ASPIAIG-S (Wirewound Resin Shield) <u>Low Power Inductors</u> AOTA (Mini Molded) ASMPH (Metal Alloy Multilayer) ASMPM (Metal Alloy Multilayer) <u>Common Mode Chokes (CMCs)</u> ACMP (Power Line SMD)
GNSS/GPS Antenna		<u>Precision GPS</u> APKG5012GD (Stacked patch) APXG6413GH-0600A (Active stacked patch)	<u>RF Inductor</u> AIMC (Ceramic Multilayer) ATEC (Thin Film Multilayer) AISC (RF Wirewound)
AC-DC Non-Isolated Power Supply	<u>MEMs Oscillator</u> AMPM (LVCMOS) <u>32.768kHz Crystal Oscillator</u> ASAKMP (1.6 x 1.2mm)	N/A	<u>Power Inductors/Chokes</u> AIRD , AIUR , AISR (Drum Core) ATCA (Toroidal)
IF (Intermediate Frequency) Filters	N/A	<u>Crystal Filters</u> F19M655000S002 (7.0 x 5.0mm) F29M255000Sxxx (7.0 x 5.0mm) F45M000000Sxxx (7.0 x 5.0mm and 3.8 x 3.8mm) F51M655000S002 (7.0 x 5.0mm) <u>SAW Filters</u> AFS20A05 (2.0 x 1.6mm, 2MHz & 5MHz BW) AFS14A11 (1.4 x 1.1mm, 11MHz BW) AFS20A20 (2.0 x 1.6mm, 20MHz BW) ABSTS5A2 (1.1 x 0.9mm, 25... 83.5MHz BW) AFS14A30 (1.4 x 1.1mm, 30MHz BW) AFS14A35 (1.4 x 1.1mm, 35MHz BW) AFS14A40 (1.4 x 1.1mm, 40MHz BW) AFS2442.0S4 (3.0 x 3.0mm, 78MHz BW)	<u>RF Inductors</u> AIAC (Air Coil) AIMC (Ceramic Multilayer) ATEC (Thin Film Multilayer) AISC (RF Wirewound)
RF Front End	N/A	<u>SAW Filters</u> AFS20A05 (2.0 x 1.6mm, 2MHz & 5MHz BW) AFS14A11 (1.4 x 1.1mm, 11MHz BW) AFS20A20 (2.0 x 1.6mm, 20MHz BW) ABSTS5A2 (1.1 x 0.9mm, 25... 83.5MHz BW) AFS14A30 (1.4 x 1.1mm, 30MHz BW) AFS14A35 (1.4 x 1.1mm, 35MHz BW) AFS14A40 (1.4 x 1.1mm, 40MHz BW) AFS2442.0S4 (3.0 x 3.0mm, 78MHz BW)	<u>RF Inductors</u> AIAC (Air Coil) AIMC (Ceramic Multilayer) ATEC (Thin Film Multilayer) AISC (RF Wirewound)

Description & Requirements	Frequency & Timing Control	RF & Antenna	Power & Magnetics
Wired Communications (Ethernet, HDMI, CAN, USB, etc.)	ClearClock® (3 rd overtone crystal oscillators) AK2A (2.5 x 2.0mm) AK2B AK3A (3.2 x 2.5mm) AK3B	N/A	Common Mode Chokes (CMCs) ACMS (Signal Line SMD) RJ45 connectors ARJ-139 (10/100/1000 Base-T) ARJE-0034 (10/100 Base-TX, SMD) ARJM11 (Through-hole) LAN Transformers ALAN110001 (POE 10/100/1G) ALAN210001 (POE+ 10/100/1G) ALAN310001 (POE++ 10/100/1G)