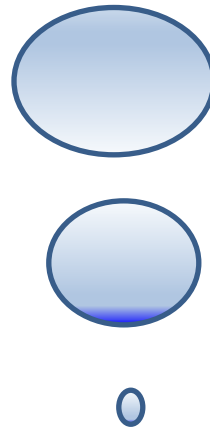


WinterGreen Research, INC.



**Mid-IR Sensors:
Market Shares, Strategies, and Forecasts,
Worldwide, 2019 to 2025**



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WinterGreen Research, Inc.
Lexington, Massachusetts

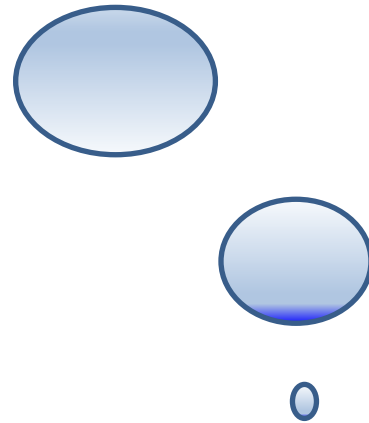
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CHECK OUT THESE KEY TOPICS

Mid IR Sensors: Mid IR Sensors Drive Internet of Things (IoT) and Next Generation Measurement of Chemical Composition Of Materials And Gas

<ul style="list-style-type: none">Mid IR SensorInternet of ThingsSense temperatureSense distanceSense presenceSense motionSense textureWavelength TunabilityHigh Optical PowerMid Infrared (IR) SensorsElectro-magnetic spectrumQC laser technologySpectrometer hardwareWireless Sensor NetworkWireless NodesHomeland securityMilitary communicationsInfrared countermeasuresChemical warfare agent detectionExplosives detection	<ul style="list-style-type: none">Medical diagnosticsIndustrial process controlsRemote gas leak detectionPollution monitoringReal-time combustion controlsMid IR sensorMicrocontrollerEnergy HarvestingVibration-Based Wireless EnergyPiezoelectric Energy HarvestersThermoelectricsGenerating Power From HeatSmart ComputingWireless Sensor NetworksSmart CitiesSmart BuildingsMilitary Remote Energy Applications	<ul style="list-style-type: none">Off-Grid Special SensorsPipeline MonitoringNavigational aidsThermoelectric coolingAutomotive SensorsSensor LightingManganese dioxideNanoparticles, NanotechnologyGraphene Self-assembly, Nanostructured Thin FilmsMicrogenerator SensorsVibration SensorsPiezoelectricitySolid State TechnologyMicrogeneratorPower Source Of SensorSensor node
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Mid-IR Sensors: Technology Evolves To Provide Better Implementation of Military, Industrial, Medical tasks

The vendors in the Mid-IR Sensors industry have invested in high-quality technology and processes to develop leading edge Internet of Things capability. Sensors are being implemented in a wide variety of applications by each vendor so as to permit benefit from first mover advantage in the market.

Mid-wave infrared (mid-IR) is the spectral region where most of the fundamental structural information is produced. Measurements in that region can provide useful information from outside the visual spectrum. Mid-IR sensors bring the ability to sense temperature, distance, presence, motion and texture. This extension of the human senses, in combination with digital systems promises a revolution in improved control of everything people use and touch.

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Mid IR sensors are the base of the Internet of Things initiatives, they form the building blocks for all different types of imaging and controls. Drones, robots, industrial robots, machines, cameras, buildings, fire departments, traffic lights, traffic control, the military, the border patrol, law enforcement, healthcare, asthma treatment, virtually everyone will increasingly use mid IR sensors.

Mid-IR sensor manufacture promises to change everything. More visibility, more awareness permits greater and more granular control of action in the military. In industry, more process can be automated. It supports more independent and safer cars. It permits electric cars to replace gasoline engine cars by 2025. Mid-IR Sensors leverage new technology to achieve better cost benefit ratios. Laboratory bench measuring systems can be miniaturized and move to the field.

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Figure 1. Mid IR Sensors Market Shares Dollars, Worldwide, 2018

Mid IR Sensors Market Shares

Dollars, Worldwide, 2018

In Millions of Dollars and Thousands of Units

	MM\$	% \$	\$ per Unit High End	Units High End	% \$ High End	\$ per Unit Low End	Units Low End	% \$ Low End
Company 1	XX	XX	XX	XX	XX	XX	XX	XX
Company 2	XX	XX	XX	XX	XX	XX	XX	XX
Company 3	XX	XX	XX	XX	XX	XX	XX	XX
Company 4	XX	XX	XX	XX	XX	XX	XX	XX
Company 5	XX	XX	XX	XX	XX	XX	XX	XX
Company 6	XX	XX	XX	XX	XX	XX	XX	XX
Company 7	XX	XX	XX	XX	XX	XX	XX	XX
Company 8	XX	XX	XX	XX	XX	XX	XX	XX
Company 9	XX	XX	XX	XX	XX	XX	XX	XX
Company 10	XX	XX	XX	XX	XX	XX	XX	XX
Company 11	XX	XX	XX	XX	XX	XX	XX	XX
Company 12	XX	XX	XX	XX	XX	XX	XX	XX
Company 13	XX	XX	XX	XX	XX	XX	XX	XX
Company 14	XX	XX	XX	XX	XX	XX	XX	XX
Company 15	XX	XX	XX	XX	XX	XX	XX	XX
Company 16	XX	XX	XX	XX	XX	XX	XX	XX
Company 17	XX	XX	XX	XX	XX	XX	XX	XX
Company 18	XX	XX	XX	XX	XX	XX	XX	XX
Company 19	XX	XX	XX	XX	XX	XX	XX	XX
Company 20	XX	XX	XX	XX	XX	XX	XX	XX
Company 21	XX	XX	XX	XX	XX	XX	XX	XX
Company 22	XX	XX	XX	XX	XX	XX	XX	XX
Company 23	XX	XX	XX	XX	XX	XX	XX	XX
Other	XX	XX	XX	XX	XX	XX	XX	XX
Total (MM\$)	XX	XX	XX	XX	XX	XX	XX	XX

Source: WinterGreen Research, Inc.

WinterGreen Research, INC.

Figure 2. Mid IR High End Sensors Market Shares Units and Dollars, Worldwide, 2018

Mid IR High End Sensors Market Shares Units and Dollars, Worldwide, 2018 In Thousands of Units				
	MM\$	% High End Units	# High End Units	MM \$ High End
Company 1	XX	XX	XX	XX
Company 2	XX	XX	XX	XX
Company 3	XX	XX	XX	XX
Company 4	XX	XX	XX	XX
Company 5	XX	XX	XX	XX
Company 6	XX	XX	XX	XX
Company 7	XX	XX	XX	XX
Company 8	XX	XX	XX	XX
Company 9	XX	XX	XX	XX
Company 10	XX	XX	XX	XX
Company 11	XX	XX	XX	XX
Company 12	XX	XX	XX	XX
Company 13	XX	XX	XX	XX
Company 14	XX	XX	XX	XX
Company 15	XX	XX	XX	XX
Company 16	XX	XX	XX	XX
Company 17	XX	XX	XX	XX
Company 18	XX	XX	XX	XX
Company 19	XX	XX	XX	XX
Company 20	XX	XX	XX	XX
Company 21	XX	XX	XX	XX
Company 22	XX	XX	XX	XX
Company 23	XX	XX	XX	XX
Other	XX	XX	XX	XX
Total (MM\$)	XX	XX	XX	XX
% High End MM\$		XX		
High End Units (%)		XX		
High End Units (in thousands)			XX	
Total Units (in thousands)	XX			

Source: WinterGreen Research, Inc.

Figure 3. Mid IR Low End Sensors Market Shares, Units and Dollars, Worldwide, 2018

Mid IR Low End Sensors Market Shares				
Units and Dollars, Worldwide, 2018				
In Thousands of Units				
	MM\$	% Low End Units	# Low End Units	MM \$ Low End
Company 1	XX	XX	XX	XX
Company 2	XX	XX	XX	XX
Company 3	XX	XX	XX	XX
Company 4	XX	XX	XX	XX
Company 5	XX	XX	XX	XX
Company 6	XX	XX	XX	XX
Company 7	XX	XX	XX	XX
Company 8	XX	XX	XX	XX
Company 9	XX	XX	XX	XX
Company 10	XX	XX	XX	XX
Company 11	XX	XX	XX	XX
Company 12	XX	XX	XX	XX
Company 13	XX	XX	XX	XX
Company 14	XX	XX	XX	XX
Company 15	XX	XX	XX	XX
Company 16	XX	XX	XX	XX
Company 17	XX	XX	XX	XX
Company 18	XX	XX	XX	XX
Company 19	XX	XX	XX	XX
Company 20	XX	XX	XX	XX
Company 21	XX	XX	XX	XX
Company 22	XX	XX	XX	XX
Company 23	XX	XX	XX	XX
Other	XX	XX	XX	XX
Total (MM\$)	XX	XX	XX	XX
% Low End MM\$		XX		
Low End Units (%)		XX		
Low End Units (in thousands)			XX	
Total Units	XX			

Source: WinterGreen Research, Inc.

Figure 4. Military Mid IR Sensor Market Shares, Market Segments, Army, Navy, Air Force, Dollars, Worldwide, 2018

Military Mid IR Sensor Market Shares, Market Segments, Army, Navy, Air Force Dollars, Worldwide, 2018
In Millions of Dollars

	MM\$ 2018	MM\$ % 2018	MM\$ Army 2018	MM\$ Army % 2018	MM\$ Navy 2018	MM\$ Navy % 2018	MM\$ Air Force 2018	MM\$ Air Force % 2018
Company 1	XX	XX	XX	XX	XX	XX	XX	XX
Company 2	XX	XX	XX	XX	XX	XX	XX	XX
Company 3	XX	XX	XX	XX	XX	XX	XX	XX
Company 4	XX	XX	XX	XX	XX	XX	XX	XX
Company 5	XX	XX	XX	XX	XX	XX	XX	XX
Company 6	XX	XX	XX	XX	XX	XX	XX	XX
Company 7	XX	XX	XX	XX	XX	XX	XX	XX
Other	XX	XX	XX	XX	XX	XX	XX	XX
Total	XX	XX	XX	XX	XX	XX	XX	XX

Source: WinterGreen Research, Inc.

WinterGreen Research, INC.

Figure 5. Mid IR Sensor Applications Market Segments, Dollars, Worldwide, 2019-2025

Mid IR Sensor Applications Market Segments,
Dollars, Worldwide, 2019-2025
In Millions of Dollars

	2018	2019	2020	2021	2022	2023	2024	2025
Applications for Mid IR Sensors								
Total MM\$	xx	xx	xx	xx	xx	xx	xx	xx
Military and Border Patrol Sensor:	xx	xx	xx	xx	xx	xx	xx	xx
Automotive Sensor	xx	xx	xx	xx	xx	xx	xx	xx
Building and Co2 Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Healthcare Laser Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Thermal Camera Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Occupancy / Photocell Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Oil and Gas Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Nitric Oxide (NO) Market Shares	xx	xx	xx	xx	xx	xx	xx	xx
Machine Process Measuring and Detection Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Fire / Gas Detection Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Temperature Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Total MM\$	xx	xx	xx	xx	xx	xx	xx	xx

Source: WinterGreen Research, Inc.

WinterGreen Research, INC.

Figure 6. Mid IR Sensor Applications Market Segments, Percent, Worldwide, 2019-2025

Mid IR Sensor Applications Market Segments,
Percent, Worldwide, 2019-2025
In Percent

	2018	2019	2020	2021	2022	2023	2024	2025
Applications for Mid IR Sensors								
Total MM\$	xx	xx	xx	xx	xx	xx	xx	xx
Military and Border Patrol Sensor:	xx	xx	xx	xx	xx	xx	xx	xx
Automotive Sensor	xx	xx	xx	xx	xx	xx	xx	xx
Building and Co2 Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Healthcare Laser Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Thermal Camera Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Occupancy / Photocell Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Oil and Gas Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Nitric Oxide (NO) Market Shares	xx	xx	xx	xx	xx	xx	xx	xx
Machine Process Measuring and Detection Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Fire / Gas Detection Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Temperature Sensors	xx	xx	xx	xx	xx	xx	xx	xx
Total %	xx	xx	xx	xx	xx	xx	xx	xx

Source: WinterGreen Research, Inc.

Figure 7. Mid IR Sensor Regional Market Segments, Dollars, Worldwide, 2018

Mid IR Sensor Regional Market Segments, Dollars, Worldwide, 2018 In Millions of Dollars		
	MM\$ 2018	% 2018
US	xx	xx
Europe	xx	xx
China	xx	xx
Japan	xx	xx
Rest of World	xx	xx
Total	xx	xx

Source: WinterGreen Research, Inc.

**Mid-IR Sensors: Market Shares, Strategies, and Forecasts,
Worldwide, 2019 to 2025**

Report Methodology

This is the 818th report in a series of primary market research reports that provide forecasts in technology, communications, telecommunications, the Internet, computer, software, telephone equipment, health equipment, and energy. Automated process and significant growth potential are priorities in topic selection. The project leaders take direct responsibility for writing and preparing each report. They have significant experience preparing industry studies. Forecasts are based on primary research and proprietary data bases.

The primary research is conducted by talking to customers, distributors and companies. The survey data is not enough to make accurate assessment of market size, so WinterGreen Research looks at the value of shipments and the average price to achieve market assessments. Our track record in achieving accuracy is unsurpassed in the industry. We are known for being able to develop accurate market shares and projections. This is our specialty.

The analyst process is concentrated on getting good market numbers. This process involves looking at the markets from several different perspectives, including vendor shipments. The interview process is an essential aspect as well. We do have a lot of granular analysis of the different shipments by vendor in the study and addenda prepared after the study was published if that is appropriate.

Forecasts reflect analysis of the market trends in the segment and related segments. Unit and dollar shipments are analyzed through consideration of dollar volume of each market participant in the segment. Installed base analysis and unit analysis is based on interviews and an information search. Market share analysis includes conversations with key customers of products, industry segment leaders, marketing directors, distributors, leading market participants, opinion leaders, and companies seeking to develop measurable market share.

Over 200 in depth interviews are conducted for each report with a broad range of key participants and industry leaders in the market segment. We establish accurate market forecasts based on economic and market conditions as a base. Use input/output ratios, flow charts, and other economic methods to quantify data. Use in-house analysts who meet stringent quality standards.

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Interviewing key industry participants, experts and end-users is a central part of the study. Our research includes access to large proprietary databases. Literature search includes analysis of trade publications, government reports, and corporate literature.

Findings and conclusions of this report are based on information gathered from industry sources, including manufacturers, distributors, partners, opinion leaders, and users. Interview data was combined with information gathered through an extensive review of internet and printed sources such as trade publications, trade associations, company literature, and online databases. The projections contained in this report are checked from top down and bottom up analysis to be sure there is congruence from that perspective.

The base year for analysis and projection is 2018. With 2018 data and several years prior to that baseline, market projections were developed for 2019 through 2025. These projections are based on a combination of a consensus among the opinion leader contacts interviewed combined with understanding of the key market drivers and their impact from a historical and analytical perspective.

The analytical methodologies used to generate the market estimates are based on penetration analyses, similar market analyses, and delta calculations to supplement independent and dependent variable analysis. All analyses are displaying selected descriptions of products and services.

This research includes reference to an ROI model that is part of a series that provides IT systems financial planners access to information that supports analysis of all the numbers that impact management of a product launch or large and complex data center. The methodology used in the models relates to having a sophisticated analytical technique for understanding the impact of workload on processor consumption and cost.

WinterGreen Research has looked at the metrics and independent research to develop assumptions that reflect the actual anticipated usage and cost of systems. Comparative analyses reflect the input of these values into models.

The variables and assumptions provided in the market research study and the ROI models are based on extensive experience in providing research to large enterprise organizations and data centers. The ROI models have lists of servers from different manufacturers, Systems z models from IBM, and labor costs by category around the world. This information has been developed from WinterGreen research proprietary data bases constructed as a result of preparing market research studies that address the software, energy, healthcare, telecommunications, and hardware businesses.

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ABOUT THE COMPANY

WinterGreen Research, research strategy relates to identifying market trends through reading and interviewing opinion leaders. By using analysis of published materials, interview material, private research, detailed research, social network materials, blogs, and electronic analytics, the market size, shares, and trends are identified. Analysis of the published materials and interviews permits WinterGreen Research senior analysts to learn a lot more about markets. Discovering, tracking, and thinking about market trends is a high priority at WinterGreen Research. As with all research, the value proposition for competitive analysis comes from intellectual input.

WinterGreen Research, founded in 1985, provides strategic market assessments in telecommunications, communications equipment, health care, Software, Internet, Energy Generation, Energy Storage, Renewable energy, and advanced computer technology.

Industry reports focus on opportunities that expand existing markets or develop major new markets. The reports access new product and service positioning strategies, new and evolving technologies, and technological impact on products, services, and markets. Innovation that drives markets is explored. Market shares are provided. Leading market participants are profiled, and their marketing strategies, acquisitions, and strategic alliances are discussed. The principals of WinterGreen Research have been involved in analysis and forecasting of international business opportunities in telecommunications and advanced computer technology markets for over 30 years.

The studies provide primary analytical insight about the market participants. By publishing material relevant to the positioning of each company, readers can look at the basis for analysis. By providing descriptions of each major participant in the market, the reader is not dependent on analyst assumptions, the information backing the assumptions is provided, permitting readers to examine the basis for the conclusions.

WinterGreen Research is positioned to help customers facing challenges that define the modern enterprises. The increasingly global nature of science, technology and engineering is a reflection of the implementation of the globally integrated enterprise. Customers trust wintergreen research to work alongside them to ensure the success of the participation in a particular market segment.

WinterGreen Research supports various market segment programs; provides trusted technical services to the marketing departments. It carries out accurate market share and forecast analysis services for a range of commercial and government customers globally. These are all vital market research support solutions requiring trust and integrity.

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About The Principal Authors

Susan Eustis, President, co-founder of WinterGreen Research, is a senior analyst. She has done research in communications, healthcare equipment, and computer markets and applications. She holds several patents in microcomputing and parallel processing. She has the original patents in electronic voting machines. She has new patent applications in format varying, multiprocessing, electronic voting, and oxygen management. She is the author of recent studies of the drone and robot marketing strategies, Internet equipment, biometrics, biomaterials, a study of Internet Equipment, Artificial Intelligence, IoT, Worldwide Telecommunications Equipment, Top Ten Telecommunications, Digital Loop Carrier, Web Hosting, Web Services, and Application Integration markets. Ms. Eustis is a graduate of Barnard College. Ms. Eustis was named Top Woman CEO in 2012 by Who's Who Worldwide. She was named Top Woman Market Research Analyst in 2012, 2013, 2014, 2015, and 2016. She has been twice featured on the cover of the Women of Distinction magazine. She was cited in a recent Time Magazine article and major media articles on Youth Sports market growth. Recently she has been quoted by The New York Times, the Wall Street Journal, HBO, the London Times and many others on that topic. Bloomberg, Barron's, the Wall Street Journal, and others quoted the studies on blockchain and cybercurrency.

About the WinterGreen Research Team: The WinterGreen Research Team is comprised of senior analysts that prepare the market research and analysis that is offered to the client and developed using an iterative process to achieve a final study. Typical projects include providing market/viability research. The team can look at how drones can be applied to critical infrastructures safety, including: type of market existing, Barriers, Forecast demand and competitors, SWOT and competitive advantages, Price Analysis, product design recommendations (marketing orientation).

Research is typically for many different regions or localities, for example EU countries including Spain, UK, Nordic, Germany, and France. Typical projects profile the United States and areas of Asia. It is common to three representative countries from South America, Brazil, Argentina, Chile, and Mexico. Representative countries from Asia APAC typically include Japan, China, India, and Australia.

Critical infrastructure safety, including: type of market existing, barriers to entry and to faithful execution of product provision, forecast of demand, market share, SWOT, competitive advantage of major competitors, identification of new technologies and new companies, price performance analysis, product design recommendations, and marketing considerations are typical topics covered.