

FOR ENERGY EFFICIENT INNOVATIONS

**THINK ON.**

[www.onsemi.com](http://www.onsemi.com)

# At the Heart of Healthcare: The Role and Growth of Semiconductors in the Medical Device Market

October 15th 2020

SIA webinar

Michel De Mey

Public Information



# ON Semiconductor Today

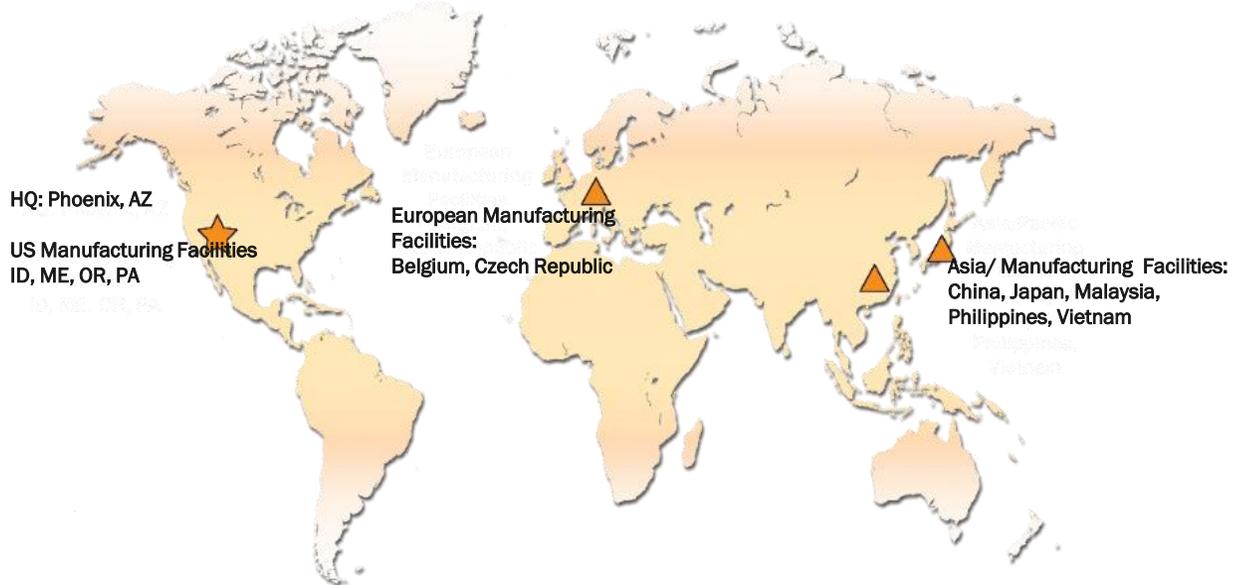
Headquarters: Phoenix, AZ

Employees: ~34,000 globally

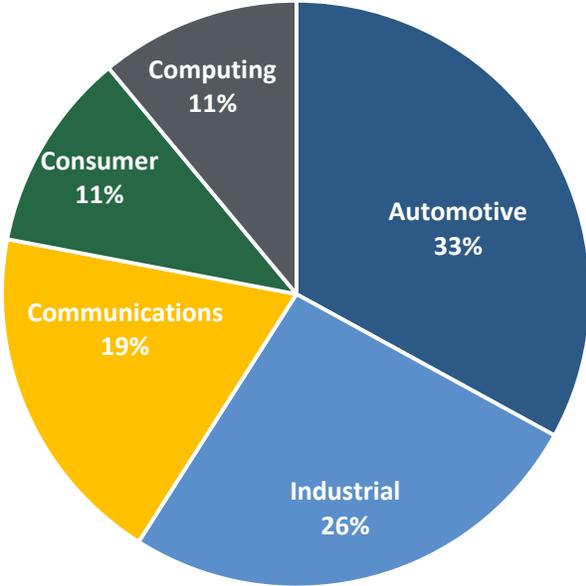
Revenue: ~\$5.5Bn<sup>(1)</sup>

Ticker: ON

Founded: Spun-off from Motorola 1999, IPO 2000



2019 Revenue by End-Market



(1) Based upon 2019 results; Sector % based on 2Q20



# Medical Semiconductor Market

## Over-the-Counter

- Thermometers
- Blood Pressure Monitors
- Heart Rate Monitors
- BMI Analyzers
- Fitness Equipment
- Weigh Scales

## Medical Imaging

- Ultrasound
- X-Ray
- MRI Scanners
- CT Scanners
- PET Scanners
- Bone Density Scanners

## Medical Devices

- Implantables
- Hearing Aids
- Pulse Oximeters
- MP Patient Monitors
- External Defibrillators
- Portable ECG/EKG
- eStethoscopes
- Infusion Pumps

## Hospital Equipment

- Spirometers
- Sterilizers
- ECG/EKG Stations
- Lab Equipment
- Telemetry
- Other

# Medical Innovation is Getting Personal



## Market Drivers / Trends

- **Aging population**
- **Longer 'Quality-of-Life' expectancy**
- **Increase incidence of heart disease, diabetes, asthma**
- **Increasing interest in health and wellness**
- **Shift to outpatient/home healthcare**
- **Increasing healthcare expenditure and health insurance reform**

## Medical Device Trends

- **Increasing "intelligence" and data storage**
- **Portability**
- **Wireless/connected solutions for 24/7 monitoring**
- **Smartphone interface**

## Medical Semiconductor Trends

- **Greater integration**
- **Miniaturization**
- **Power efficiency**
- **Embedded wireless functionality**
- **Monolithic disposable solutions**

Sources: Department of economic & social affairs, United Nations, WHO, ON Semiconductor

# Medical Solutions



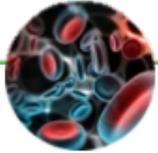
## Portable Medical Devices

Portable medical device use is rapidly expanding as advancements in wireless technologies have increased patients' mobility at hospital or at home. Devices are used in ever-increasing applications such as cardiac, respiratory, and fitness & wellness.



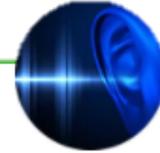
## Medical Imaging Devices

ON Semiconductor provides advanced capabilities for the latest high resolution medical imaging devices.



## Clinical Point-of-Care

The rise of point-of-care technologies and devices has allowed for more testing and diagnosis close to the patient, resulting in increased effectiveness and success rates. Advancements in medical testing technologies (blood glucose, oxygen saturation, rapid strep, etc.), and minimally to non-invasive genomic diagnoses such as liquid biopsies, have presented patients with improved point-of-care diagnostics and faster access to treatment options.



## Audiology Focus

Hearing loss is a silent problem that often goes untreated for years. Recent studies have shown that adults with untreated hearing loss have significantly higher rates for psychosocial disorders such as depression and anxiety, are at higher risk of developing dementia, and incur higher medical bills compared to those without hearing loss.



## Patient Monitoring

ON Semiconductor focuses on services and products specifically designed for low power, reliable patient monitoring applications.

<https://www.onsemi.com/solution/medical>

# Medical Ventilator

8 Subsystems	# ON Semi Devices
MCU & Processing	16
LCD & Touch Screen	5
Iso Power Supply – LLC Conv	16
Iso Power Supply – PFC	6
Power Management	3
Battery Management	10
Valve Drive Module	11
BLDC Drive Module	18
<b>Total ON Semiconductor Devices</b>	<b>85</b>

Home > Blog > Innovation > COVID-19's Helping Hand, Medical Ventilators, Require Semiconductor Components to Function

## COVID-19's Helping Hand, Medical Ventilators, Require Semiconductor Components to Function

by Steven Dean - 04-08-2020

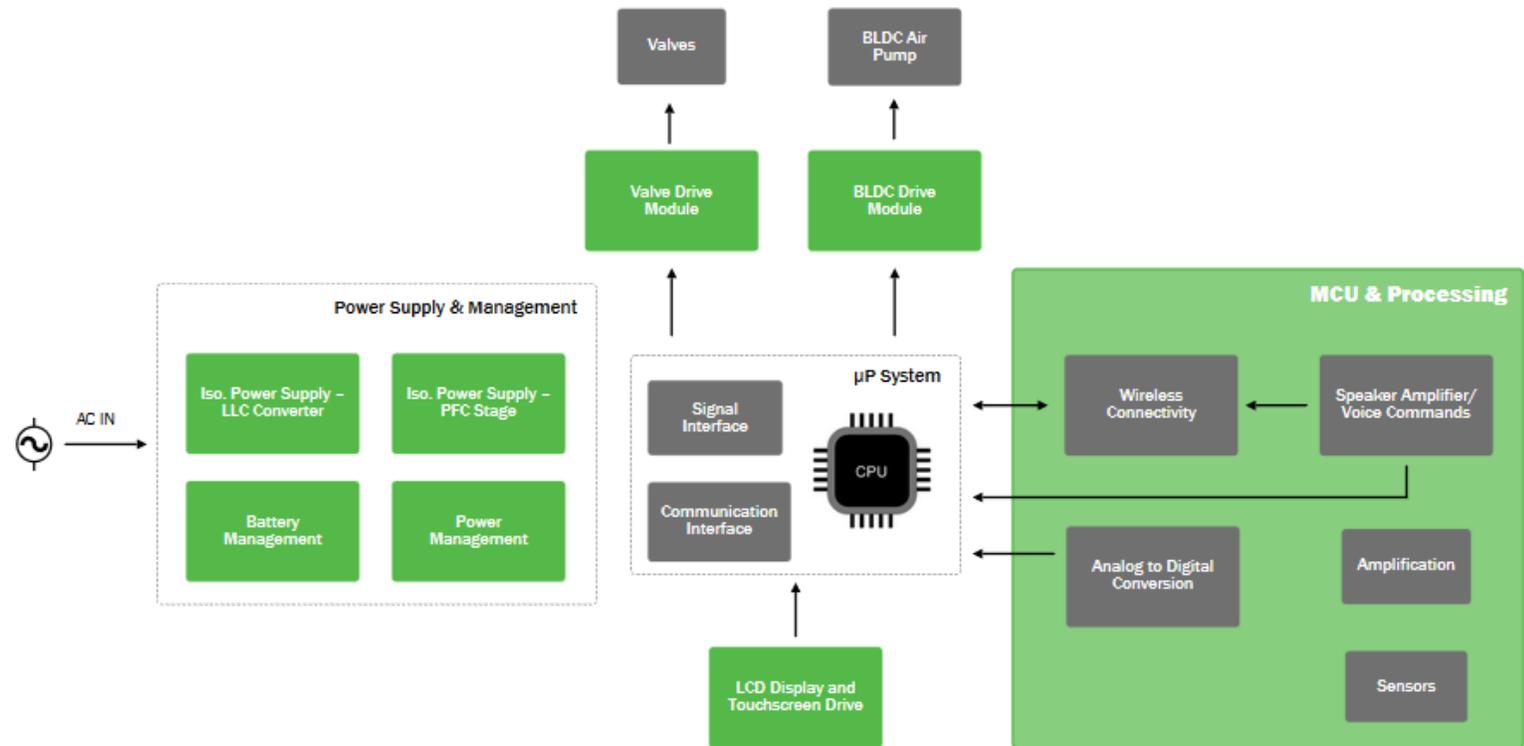


As I write this, I'm working in my home office sequestered like most of the world's population. I take this time to write while it is quiet, as quietness has quickly become a rarity in this household. My wife Kathy and I are babysitting our grandson Charlie, while Charlie's mom is deemed an essential worker as an Intensive Care Unit nurse at a local Arizona hospital. As we operate under a state-wide 'stay at home order' here in Arizona, babysitting our grandson could, through a certain lens, appear like we are non-compliant to that order. Well, we're not. Currently, she's acting as a resource nurse with 31 COVID-19 patients, 11 of which are relying on medical ventilators, a life-saving technology that is unfortunately under a global shortage during this pandemic.

The rapid increase in the number of COVID-19 hospitalizations has created an unprecedented strain on the world's inventory of ventilators. ON Semiconductor and our operations have also been deemed as essential and critical infrastructure by the Department of Homeland Security as our company is a supplier of semiconductor components, which are a critical part of the supply chain for medical device manufacturers. Our products are used in a variety of medical devices, including ventilators, which are helping keep COVID-19 patients with severe cases breathing. For those unfamiliar with a medical ventilator, ventilators move air in and out of the lungs in cases where patients are not physically able to breathe on their own and applications or use cases can be quite broad. Often the machine forces humidified and warmed air with supplemental oxygen into the lungs. Equipment can be found in intensive care units, emergency rooms, ambulatory (meaning first responder situations) and in the home.

Here I explain how my family and I are impacted by the COVID-19 pandemic and the significance of ON Semiconductor's life-saving medical technologies.

Source: <https://www.onsemi.com/blog/innovation-forum/on-semiconductor-ventilators>



Source: <https://www.onsemi.com/block-diagram/medical/medical-ventilator>



# Improving Lives through Innovative Solutions

- Semiconductor components are ubiquitous in medical devices
- The semiconductor devices range from standard components to very specialized Application Specific Integrated Circuits with a high level of customization and innovation
- The bill of materials for a medical device ranges from tens of semiconductor components to several thousands
- ON Semiconductor and our operations have been deemed essential and critical infrastructure by the Department of Homeland Security

Learn more at [www.onsemi.com](http://www.onsemi.com)