

qorvo

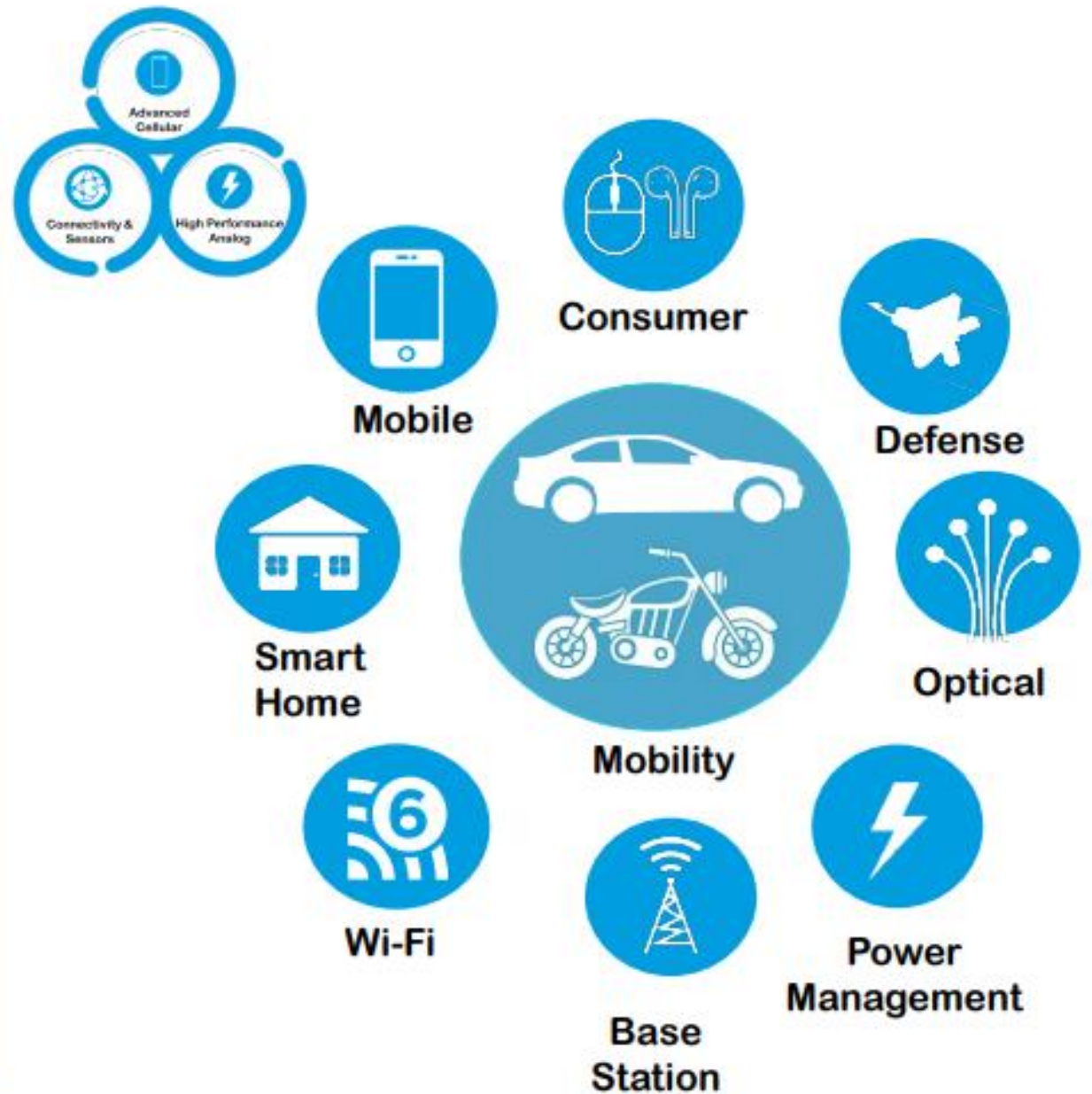
all around you



About Qorvo...

Diversified and Above-Market Growth

- 30+ Year old company headquartered in Greensboro, North Carolina, USA
- Strong technology leadership combined with high volume manufacturing capabilities
- \$4B trailing 12-month revenue
- Over 8 Billion products shipped per year
- 8400 global employees
- An S&P 500 company (Nasdaq: QRVO)
- Consistently ranked with highest quality ratings from our leading customers



Source: Industry reports and management estimates.



Qorvo Value Solution

Automotive RF, Power and Sensor



TCU

Infotainment

- Wi-Fi
- Navigation (GNSS)

Telecommunication Control Unit (TCU)

- Wi-Fi module
- V2X – DSRC/C-V2X
- BAW filters (co-existence)
- eCall switches
- Bluetooth® technology
- GNSS

Network Access Device (NAD)

- LTE MHB PAMiD
- LTE LB PAD
- 5G FEMs
- APT modulator
- Switches



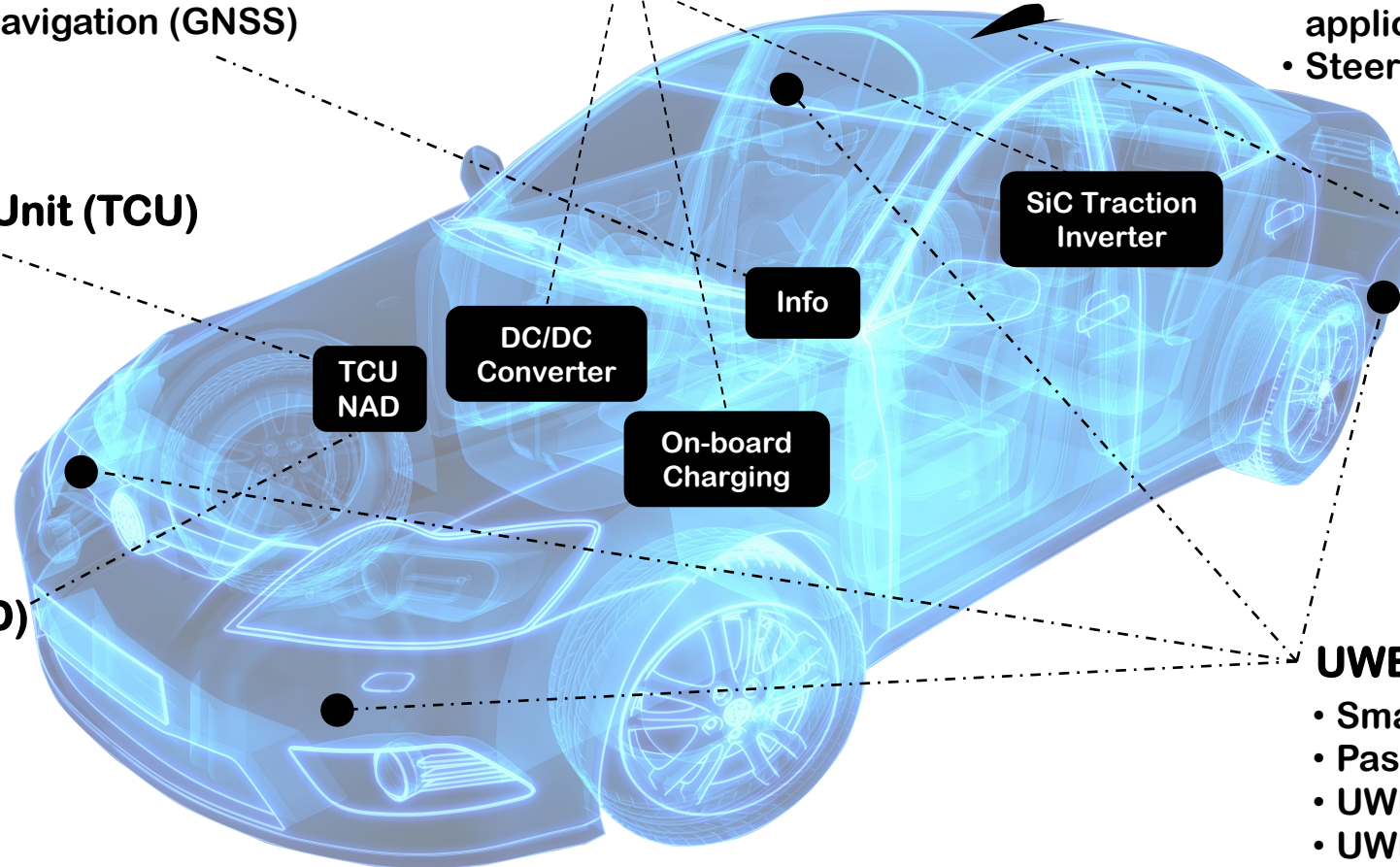
NAD

Power Solutions:

- USB charger/control
- Motor control
- EV battery charging
- Inverters

Sensor HMI Solutions:

- Multi-level, force-sensing for smart surfaces/interiors
- Touch and touchless
- Rugged environments and applications
- Steering wheel and displays



Antenna

- SDARS (SiriusXM)
- V2X compensator
- Antenna tuners
- Switches
- mmWave

UWB

- Smart car access
- Passenger detection
- UWB inside car
- UWB in key fobs



Qorvo's Capabilities Serve the Automotive Market

Automotive quality is our mission

Qorvo's technology and product portfolio is uniquely positioned to support advanced automotive platforms

Commitment to deliver high quality products to our partners

High power HBT amplifier process

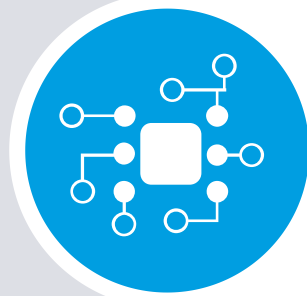
SAW and BAW filter technology

SOI design leadership

SiGe BiCMOS: PAs, control, etc.

Automotive qualified manufacturing

6 reliability labs, worldwide



AEC qualification

Supply chain vetting for automotive lifetime support

Advanced technology assessment for auto suitability

Automotive manufacturing flow

Supply chain: automotive certified

Yield & return history



Automotive Qualified Force Sensing Applications

QORVO®

Enabling Innovative HMI Turnkey Solutions

STEERING WHEEL

- Innovate industrial design
- Higher reliability

DISPLAYS

- Triangulation and analog z
- Eliminate false actuations

SMART SURFACES

- Material agnostic design
- Enable new features

Some Latest Automotive HMI In The Market

From mechanical buttons to smart surface



What can force sensor do for automotive HMI

Not only to detect the force

- Eliminate false trigger of cap touch
- Press without looking for cap touch
- Waterproof for cap touch
- Multiple-level force trigger at one button
- Gapless ID design
- 3D(XYZ) touch HMI design
- Support more surface material
- Support more input(finger, glove...)
- Provide H/W redundancy for functional safety
-

- Cap touch + force sensor solution
- Or
- Force sensor only solution



About Qorvo Sensing Solutions

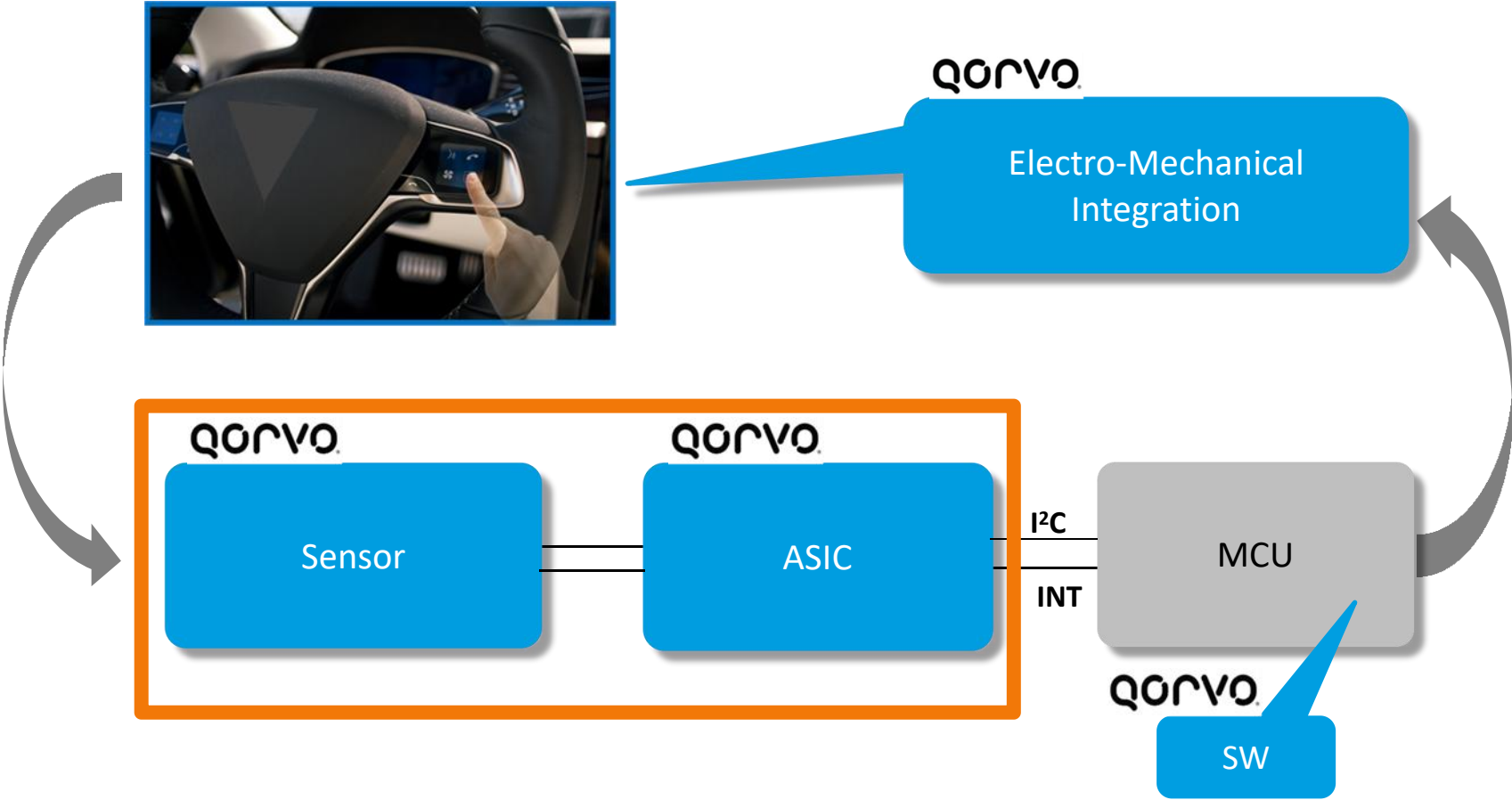
- **Best-In-Class Force/Gauge sensors**
- **Disrupting Incumbent Technologies**
 - **Capacitive Touch, Mechanical Buttons, Strain-Based Devices**
- **70 Patents Filed Worldwide, 28 Inventions**
- **Significant Adoption of Technology**
 - **Automotive, TWS, Wearables, Personal Care, Smartphones, Computer;**
- **Reliable Sensing Solutions**
 - **AEC-Q100, PPAP Level 3**

19 vehicles in mass production till now;



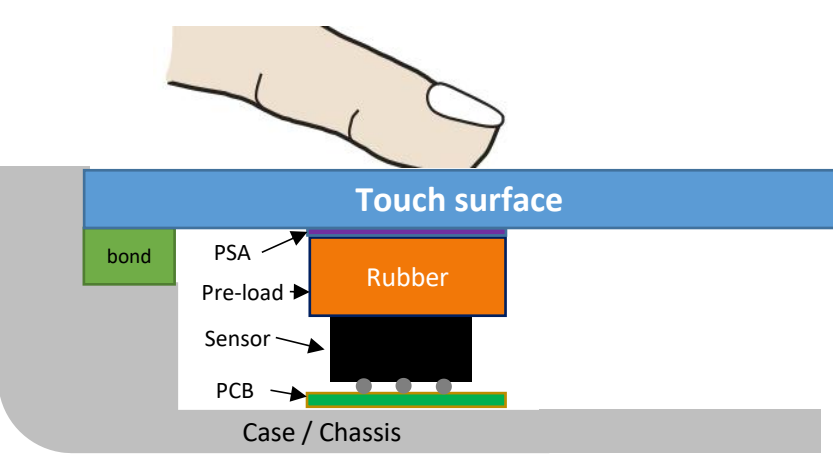
Total Solution

Sensors, ASIC, Software, Mechanical Integration

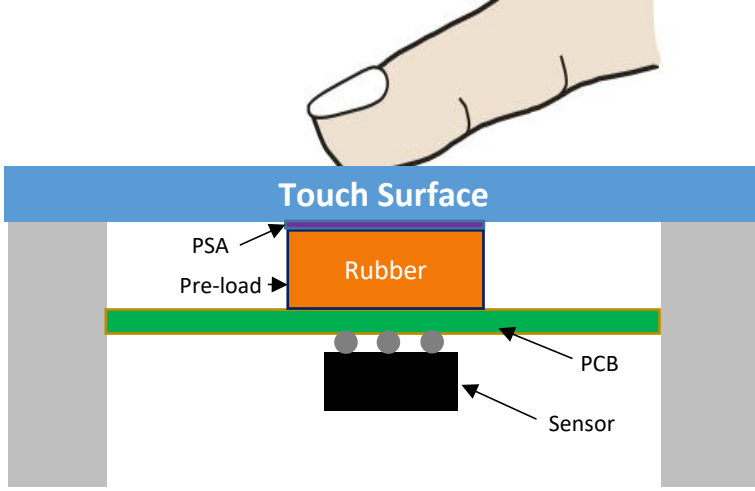


MEMS Force Sensor Families

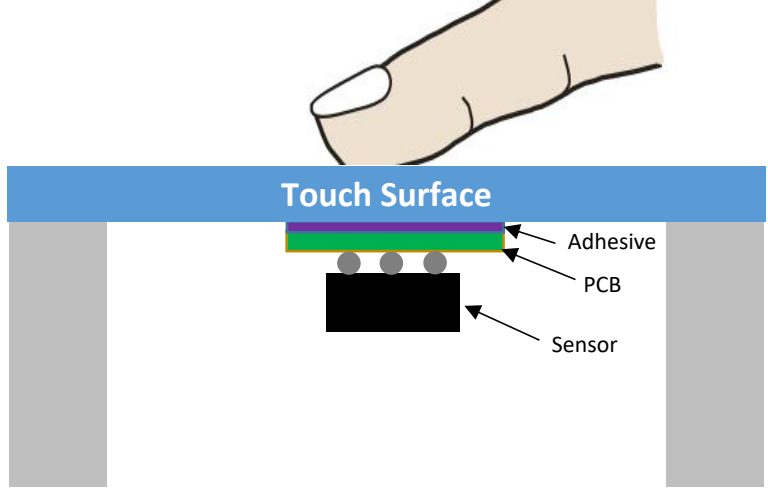
Flexibility to meet sensitivity and manufacturing needs of any application



Pre-Loaded
(Requires contact on both sides)



Pseudo Pre-Loaded
(Contact on one side)



Suspended
(Contact on one side)

Smart Cabin Force Sensing Applications

Superior User Experience

STEERING WHEEL



- Innovate industrial design
- Higher reliability

 Sensor

SMART SURFACE



- Material agnostic design
- Enable new features

DISPLAYS



- Triangulation and analog z
- Eliminate false actuations



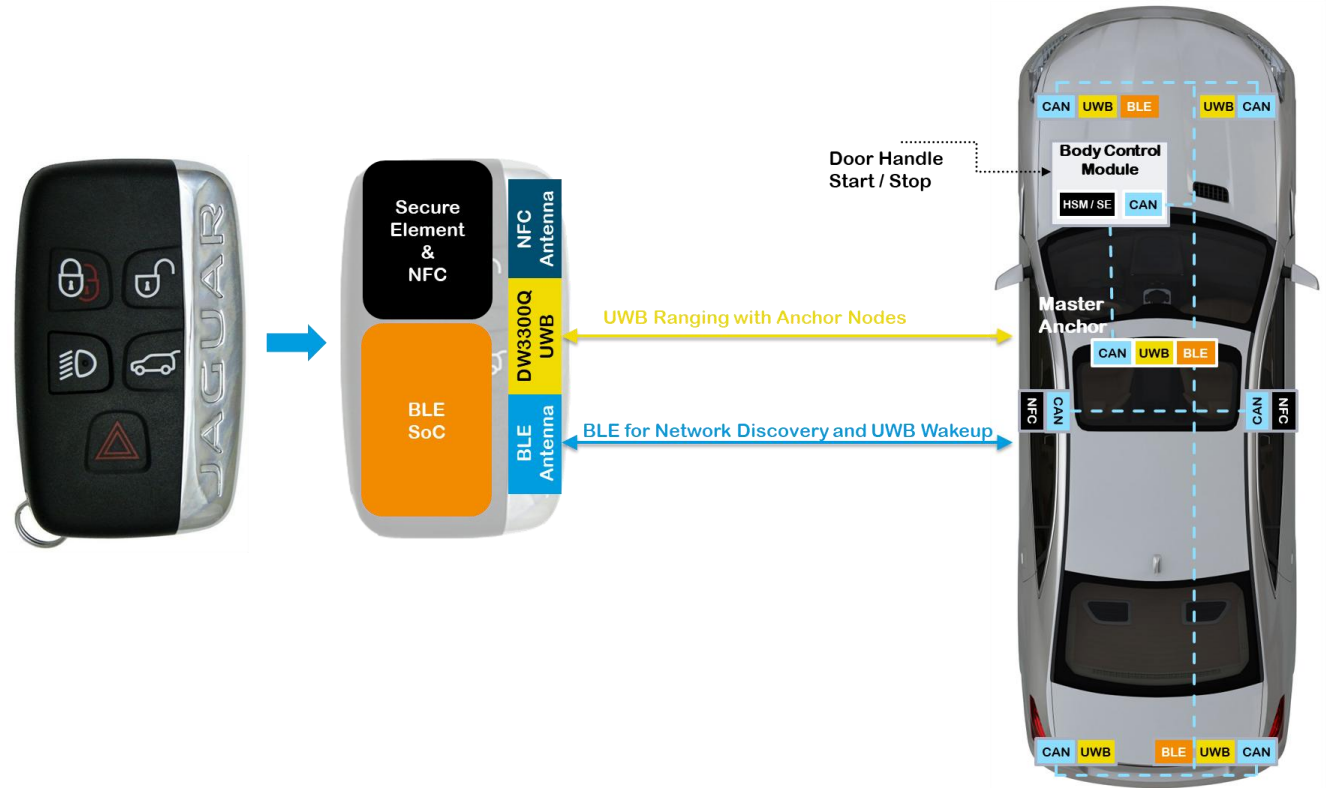
Exterior Force Sensing Application

Superior User Experience

DOOR HANDLE



- Innovate industrial design
- Material agnostic

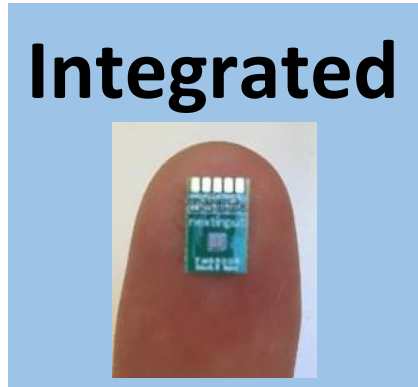
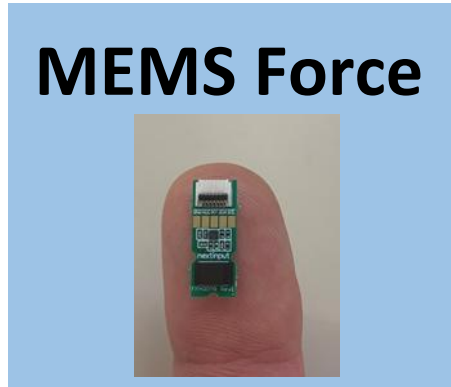


How to start with Qorvo force sensor



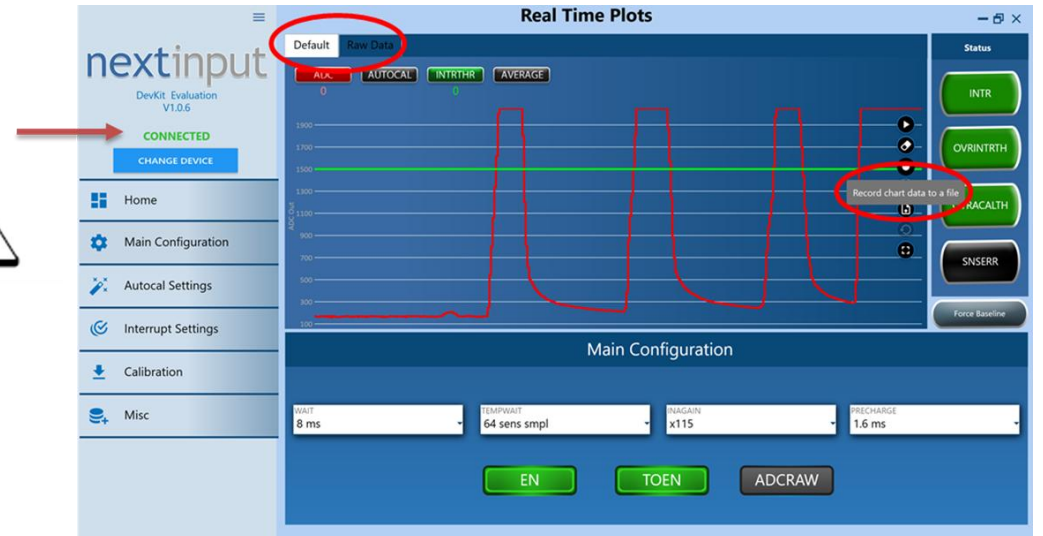
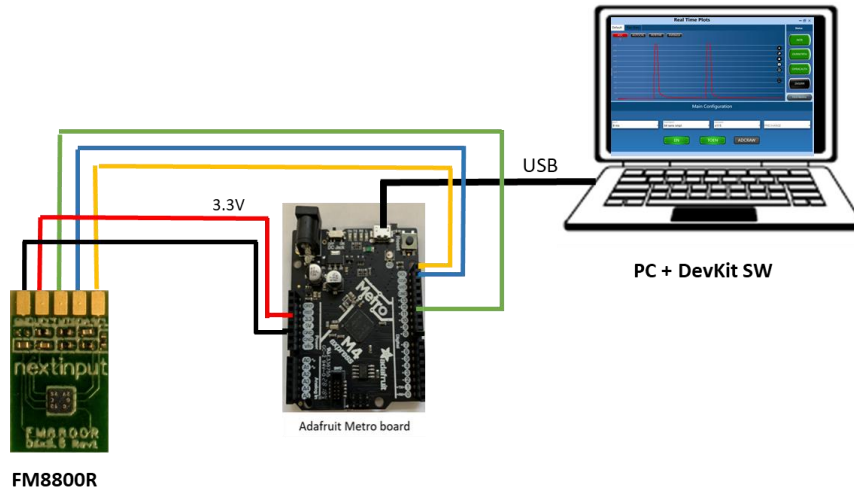
Enablement Tools

Dev-Kits, GUI, Drivers



FM4000R

FM8800R



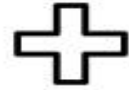
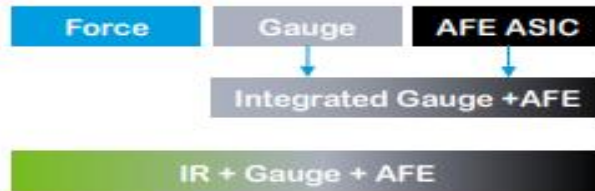
Sensing Solutions

Qorvo offers turnkey solutions to enable customer success

Silicon Sensors



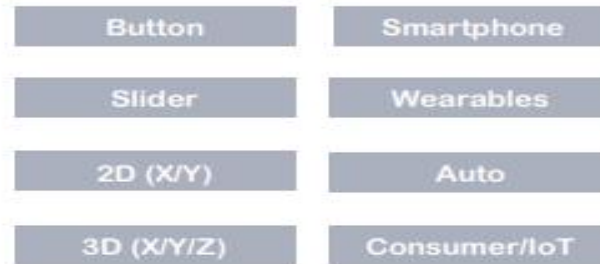
Discrete, integrated, and hybrid sensors



Software



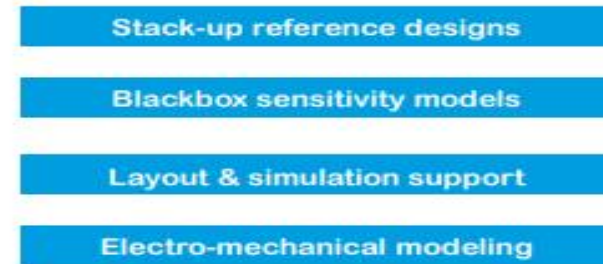
Drivers & algos that run on host MCU



System Integration



Design examples, service, & support



Electrical	Mechanical	Software	Assembly
Schematic review	CAD review	Drivers	SMT guidelines
Layout review	CAD simulation	Calibration (binary code)	Rubber & Adhesives
Quality reports	Simulation models	Triangulation	Characterization guidelines
AECQ-100 reports	Mechanical Stop	EOL Verification & Test	





Thank You