

## The Building Blocks of our Driverless Future

The move to electric vehicles is helping to advance autonomous driving. Behind the scenes is a technology disruption involving everything from electronics and energy systems to batteries, electronic materials, device solutions and displays. Take a look at some of the tech that will power AVs and help them to navigate our roads.

### DID YOU KNOW?



#### TIME-OF-FLIGHT (ToF) SENSOR

DELIVERS LONG-RANGE 3D IMAGE INFORMATION TO THE VEHICLE

Some TOF sensors can detect objects up to **820 feet** away even at night with poor visibility!



#### INERTIAL MEASUREMENT UNIT (IMU) SENSOR

HELPS ORIENT AUTONOMOUS VEHICLES

An IMU works similarly to your inner ear, helping you know if you're being moved even if your other senses are diminished.



#### ARRAY MIC SENSOR

IDENTIFIES THE SOURCE AND LOCATION OF NEARBY SOUNDS

Microphone array technology dates back over **100 years**, when the military used it to detect submarines, ships and planes.



#### BACKUP POWER FOR DATA STORAGE

SAFEGUARDING HUGE QUANTITIES OF DATA

One autonomous vehicle generates about 30 terabytes of data daily – that's **3,000 times** the data produced by all Twitter users in one day!



#### LITHIUM-ION BATTERIES

SUPPLYING VEHICLES WITH CLEAN ELECTRIC POWER

Rechargeable lithium-ion batteries almost exclusively power today's smartphones and laptops – not to mention the vast majority of hybrid and electric vehicles.



#### DC CONTACTOR

AUTOMATING HIGH-VOLTAGE DISCONNECTS

Over **10 million** Panasonic DC contactors are automating electric and hybrid vehicles today.



#### ENERGY POLYMER CAPACITOR (EPC)

ENABLING QUICK BURSTS OF HIGH POWER

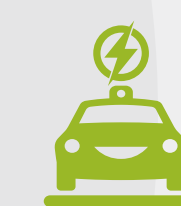
Panasonic's high-power assist capacitors might one day be able to replace lead-acid batteries in vehicles, reducing vehicle weight and cutting emissions.



#### ELECTRIC DOUBLE LAYER CAPACITOR (EDLC)

A SUPERCAPACITOR WITH NUMEROUS AV APPLICATIONS

EDLCs work as an energy backup solution in the event of total electrical failure, enabling critical functions such as emergency braking, power steering and power door locks.



#### STRETCHABLE POLYMER TECH

ALLOWS FOR SOFT, FLEXIBLE OR IRREGULARLY-SHAPED ELECTRONIC COMPONENTS

Panasonic's stretchable insulating resin film can stretch to **2.5 times** its length and return to its original form – paving the way for stretchable tech.

