

The Nissan LEAF e-powertrain at a Glance

Case Study

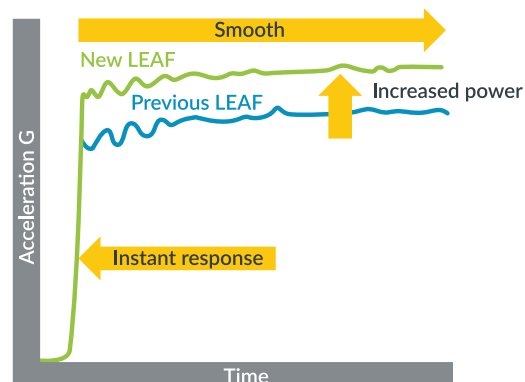
The Nissan LEAF is equipped with the latest intelligent driving technologies that demonstrate the future of dynamic driving. The all-electric Nissan LEAF is a great example of the smart, sustainable and intelligent mobility offered by Nissan.

Nissan LEAF e-powertrain

The new and improved e-powertrain provides the latest Nissan LEAF model with 110 kW of power output and 320 Nm of torque. The newly developed inverter has enabled an improvement in the vehicles acceleration and has had a positive impact on driver experience.

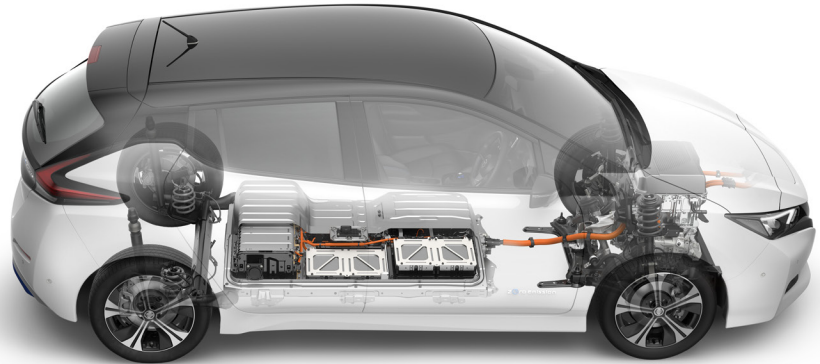
These improvements have been made possible with the new power module which has increased the motor drive current. It features an Arm core processor, the Cortex-R4, and the latest control technology to increase efficiency and output – enabling approximately 1.3 times more torque and power than the previous Nissan LEAF.

In controlling the inverter, the Arm-based microcomputer core accurately repeats a series of processes such as sensing, calculation, and control output for the events that occur in 1/10,000 second cycles. Nissan found that the Arm Cortex-R family of cores was the right choice due to its efficient performance and responsiveness enabling it to dependably deliver the precise control needed within such a tight computation window.



Chassis and Body Improvements

The Nissan LEAF delivers outstanding performance and mobility. In addition to the increased output of the electric motor and inverter, the chassis has been upgraded to improve stability. By placing the battery and other heavy items close to the center of gravity, the yaw moment of inertia has been reduced compared to front-engine vehicles for improved stability and smoother cornering.



Nissan e-Pedal

To add to the list of driving experience improvements Nissan has developed its revolutionary e-Pedal technology. This new innovation enables the driver to start, accelerate, decelerate and stop by simply increasing or decreasing the pressure applied to the accelerator. When the accelerator is fully released, regenerative and friction brakes are applied automatically, bringing the car to a complete stop. The car holds its position, even on steep uphill slopes, until the accelerator is pressed again. The reactivity of the e-Pedal maximizes EV driving pleasure.

Why Arm?

When Nissan chose a microcomputer for the Nissan LEAF inverter, the focus was placed on having a pulse generator and angle detection function specialized for motor control. Furthermore, Toshiba's Arm-based microcomputer was chosen to achieve the above-standard performance and support for functional safety.

Another important part of the decision to partner with Arm for the Nissan LEAF was its wide ecosystem and accessibility to the engineering community around the world who are adept at working with the Arm portfolio as well as the variety of tools that are supported by a wide variety of Arm cores.

For more information on Arm's powertrain solutions, please visit:

<https://www.arm.com/solutions/automotive/powertrain>

