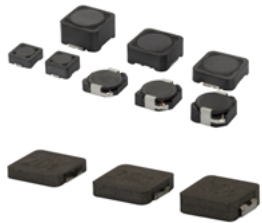
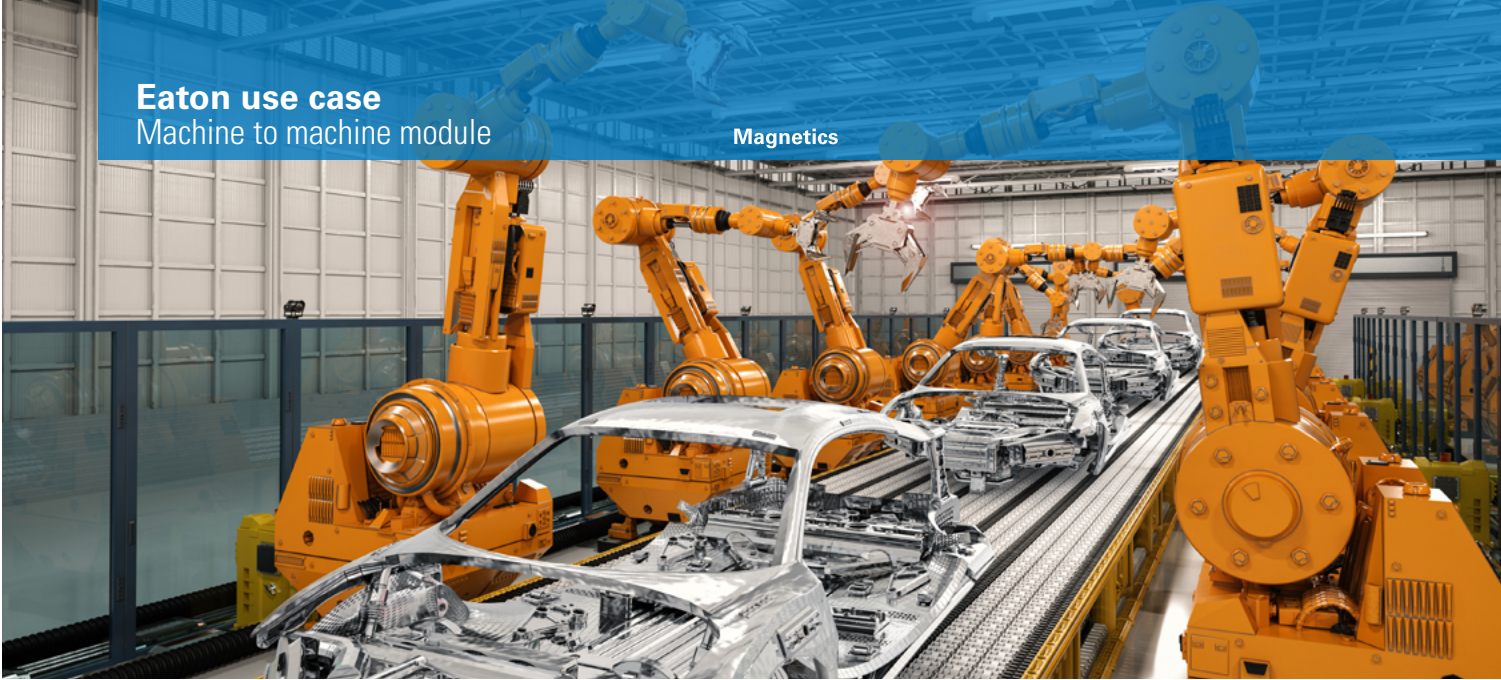


## Eaton use case Machine to machine module

Magnetics



# Eaton power inductors help minimize EMI in M2M modules

Machine to Machine (M2M) communication refers to direct communication between devices via shared wired or wireless channels. Networks of interconnected devices such as sensors, microcontrollers, and actuators create intelligent systems for industrial, commercial, and everyday applications. Some applications for M2M technology include energy metering, mobile computing, security, driver assistance systems, payment transactions and verification, tracking and tracing, router/gateway systems, and M2M consumer devices.

M2M technology is closely related to the ubiquitous Internet of Things (IoT), yet with several key differences. For example, while M2M systems utilize

point-to-point communication between devices, IoT systems rely on an internet connection. Moreover, M2M systems store process data in localized memory, whereas IoT systems store and retrieve data from the cloud. M2M communications are present in everything from household appliances (e.g., between a sensor on a remote controller and a TV sensor) to personal devices (e.g., Bluetooth file sharing between smartphones).

Electromagnetic interference is a common issue in interconnected devices, causing several notable challenges such as lower throughput, impacted signal integrity, and more. M2M systems require adequate EMI shielding to minimize noise intrusion and ensure reliable

operation. Eaton's MPI and DR families of power inductors provide magnetic shielding for low EMI in M2M modules.

The MPI inductor family consists of several low profile, surface mount components, ideal for high power density applications with inductances from 0.1  $\mu\text{H}$  to 22  $\mu\text{H}$  and operating frequency up to 3 MHz. MPI inductors are designed with durable pressed powder material to withstand operating temperatures from  $-55\text{ }^\circ\text{C}$  to  $+125\text{ }^\circ\text{C}$ . With current ratings between 1.2 A and 22 A, they have the highest current handling capacity in a compact footprint (2.2 mm x 1.8 mm x 1.00 mm for MPI20-V1, 2.7 mm x 2.2 mm x 1.25 mm for MPI25-V2, and 4.75 mm x 4.45 mm x 1.50 or 2.00 mm for the MPI40-V2).

Eaton's DR family of high-power density and high efficiency inductors are low profile, magnetically shielded components available in several form factors. DR inductors are comprised of ferrite core material in a shielded drum construction with inductance values ranging from 0.33  $\mu\text{H}$  to 1000  $\mu\text{H}$  and operating frequencies up to 1 MHz. These products have current handling capabilities from 0.25 A to 56 A and can withstand operating temperatures from  $-40\text{ }^\circ\text{C}$  to  $+125\text{ }^\circ\text{C}$ .

Both the MPI and DR inductor families from Eaton comprise eco-friendly materials to minimize the impact of electronic waste. Both products are lead-free, halogen-free, and RoHS compliant.

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