Product Applications for EV/HEV

by

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- **Concerned function deployment of a vehicle**

A1

Power control unit
(PCU) 動力控制單元

C

Electronic stability control
(ESC) 電子防滑穩定控制系統

A2

Electronic control unit
(ECU) 電子控制單元–
俗稱行車電腦

D

Radiator fan & A/C control system
冷卻風散與空調壓縮機控制系統

B

Electrical power steering
(EPS) 動力轉向系統

E

Electronic injector driver unit
電子噴油器驅動系統

- **Functional blocks of automotive electric power management for PCU & ECU**

Inverter for Motor

Battery charger for EV/HEV

AC Inverter

DC-DC Converter

◎搭載系統

Plug-in
Power Control Unit
Motor
輔助系統 Inverter
Converter

For EPS-ECU

A1. Power Control Unit (PCU)

- 12V 辅助动力转换器
- 电抗器及小型电容器

- **Reactor for PCU**

High side DC/DC Converter (HDC) is used to realize high torque in inverter motor in EV/HEV. The Boost converter pumps up the battery voltage 201.6V to high voltage 650V. The boost reactor is taking the key function to pump it up.

A2. Electronic Control Unit (ECU)

To make the power consumption efficient ECU plays a crucial role to optimize the management. ECU also sends the order to the concerned parts to make proper response by receiving the feedback signal from the sensors or transmitters equipped around in the vehicle.

A clean and stabilized DC voltage source from the DC-DC converter is then of very importance to supply to the ECU. The boost inductors and EMI filtering chokes are playing the key role to meet the strict requirement.

Hi-current choke: PSC series

Standard power inductors

B. Electrical Power Steering (EPS)

Boost chokes ***EMI filtering chokes***

<EPS Inverter >

BWLM-TR series for power chokes

C. Electronic Stability Control (ESC)

The ESC systems have been very beneficial in that they reduce the propensity of these vehicles to roll-over and many new and upcoming vehicles of this type are getting them as standard equipment. The National Highway Traffic Safety Administration in USA has already been making stability control mandatory on all vehicles by 2012.

Buck converter used to down the battery voltage to 5V for the sensors and transmitters of ESC system. The buck inductors and EMI filtering chokes are playing the role to suit the function.

SMD power chokes

Dip-type power chokes

D. Radiator fan control & A/C compressor system

Battery(12V) →	Inverter →	Motor (Small vehicle)
Battery(12V) → 42V Boost →	Inverter →	Motor (Mid size vehicle)

Boost chokes ***EMI filtering chokes***

BWLX-PQ series for boost chokes

BWLM-TR series for filtering chokes

E. Electronic injector driver unit (for HEV)

High compression ratio requiring high pressure such as 200MPa needs more power into the injector with the help of boost converter to boost 12V battery voltage up to 40V to do the job.

Series engine : 1 boost choke

Parallel V6 or V8 engine : 2 boost chokes

Engine

BWLX-PQ series for boost chokes

- **Magnetic components supported by BW with certification of ISO/TS16949**

With high reliability, high current, high power, low power loss, EMI-suppression, … to suit the severe requirement of vehicle applications.

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