

# ENERGY SAVING IN AN EFFICIENT WAY

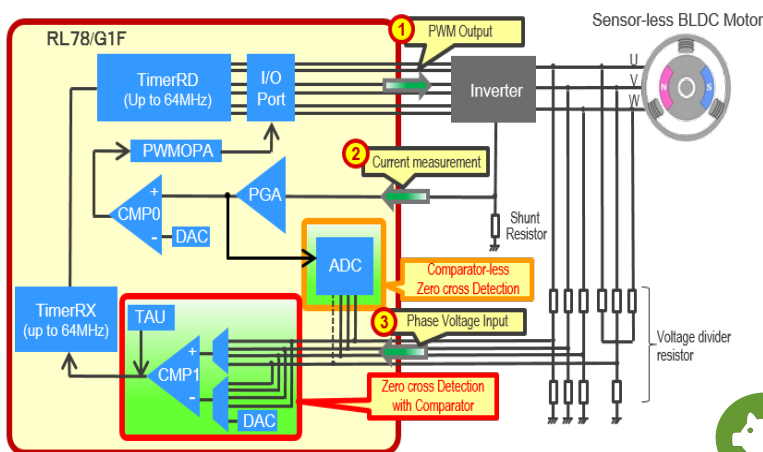
Find out how to with Handy Vacuum Cleaner Quick Solution



Sensorless 3 phase BLDC motor rotates at high speed to meet the suction strength of each power level - High (50krpm) and Low (30krpm). 120-degree conduction control is driven with a single **RL78/G1F MCU** that enables efficient use of board space and resolves problems in sensorless motor to realize a highly efficient system that saves energy with smooth and high torque startup without any compromises in safety.

## EFFICIENT USE OF BOARD SPACE AND COST WITH BUILT IN FUNCTIONS

Block diagram of sensor-less BLDC motor  
120-degree conduction control circuit with RL78/G1F



Save board space by conducting rotor position detection with a single RL78/G1F chip with its built-in Timer RD and 4-input comparator (CMP0).



Save energy with the built in Timer RD as it lowers power consumption by operating 2x faster than CPU clock.



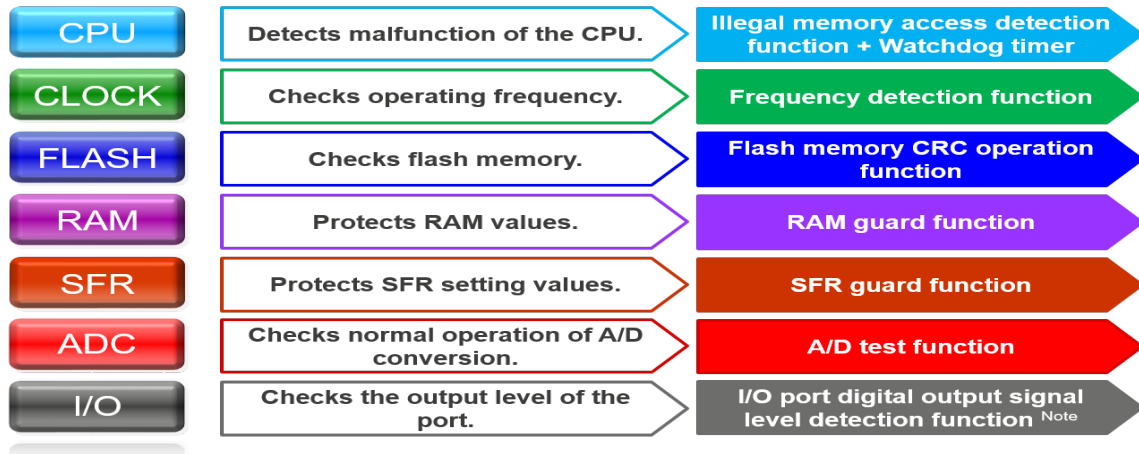
Save cost with RL78/G1F built in functions as no additional external parts are needed in the BOM.

High reliability with RL78/G1F large ROM capacity that enables Programmable Gain Amp (PGA) and comparator (CMP0) to detect over-current and force shutdown of PWM signal without CPU intervention.



## MCU AND ANALOG COMBINES TO PROVIDE A HIGH LEVEL OF SAFETY DESIGN

### Safety functions provided by MCU – RL78/G1F



### Safety functions provided by Li-ion battery monitor IC – ISL94202



Monitors cell current and voltage to provide over-current, over-voltage and under-voltage protection.



Controls battery charge and discharge

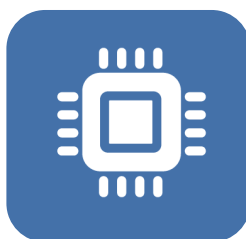


Monitors temperature

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