Recent years have seen the continued development of fuel efficient and hybrid vehicles that emit reduced levels of exhaust gases, including carbon dioxide (CO₂), due to the increasing demands on the automobile industry for environmental protective measures and improved gas mileage. In order to provide optimal gear ratios for all driving conditions, a continuously variable transmission (CVT) that allows the engine performance to operate at peak efficiency has been developed that replaces the conventional fixed gear ratio transmissions with a combined planetary gear and torque converter structure. Mini-vehicles are no exception to such demands and they must satisfy them at a low cost. This paper discusses a lightweight compact CVT unit newly developed by Daihatsu and an electronic control unit (ECU) developed jointly between Daihatsu and Fujitsu Ten. The paper also introduces an integrated circuit developed in response to a shortened development period by Fujitsu Ten in order to provide lower costs and improved product quality.
1.1 Background to development of a Continuously Variable Transmission (CVT) system for mini vehicles

1.2 Design: Division of design roles between Daihatsu and Fujitsu Ten

2.1 Differences with conventional CVT units (Characteristics)
3.1 Outline of CVT/ECU control (Software control)

3.2 Outline of CVT/ECU hardware structure
Development of CVT/ECU for Daihatsu Vehicles

3.3 Development of the custom IC (Sprout)
Power MOSFET over-current detection protection function

Power MOSFET overheating detection protection function
4.1 Development achievements

Conclusions

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