

1. General Description

The A.D.C. automotive radar system for autonomous intelligent cruise control (AICC) and collision warning monitors the traffic area in front of the vehicle using three stationary independent millimeter wave radar beams.

Moving and stationary objects are detected and their distance and relative velocity is measured and processed continuously.

Sixteen times per second the actual traffic situation is analyzed by a digital signal processor within the ECU supplying information to engine control and brake systems in order to operate the vehicle in a distance controlled mode referenced to the relevant object ahead. In case of critical situations a warning can be given to the driver in order to enhance his reaction time.

Due to its physical nature the radar sensor is offering excellent performance characteristics even in adverse weather conditions (fog, rain and snow).

Additional information of vehicle driving conditions is required from standard or specialized in-vehicle sensors, e.g. speed, steering angle and/or yaw rate. This data is made available to the ECU via a universal car network (e.g. CAN) or specific interface circuits.

System hardware configuration is characterized by a two box design with a radar sensor (front end) mounted in the front of the car, typically behind the radiator, and a related Electronic Control Unit in an arbitrary location. Car specific demands and cost issues may lead to a one box solution in the future.

Packaging of the radar frontend is self-contained and the unit is applicable in space critical vehicle environments. The antenna design is based on a monostatic patented reflector arrangement offering optimum mechanical dimensions.

A block diagram of the system is shown in fig.1