Ainstein T-79: Automotive 79GHz Short Range Radar

A next-generation short-range, wideband and high-resolution radar sensor for Advanced Driver Assistance Systems (ADAS).

The Ainstein T-79 is designed for Advanced Driver Assistance Systems (ADAS) applications, like warning or assisted braking functions, blind spot monitoring, lane change assist and rear crossing traffic alerts.

It is based on 79GHz technology and contains six planar antennas, four for reception and two for transmission. The sensor has a field of view of ±45° in azimuth and a maximum range of 55m.

Resulting from a collaboration with Texas Instruments (TI), the system integrates only one electronic board, equipped with a TI CMOS single-chip millimeter wave (mmWave) sensor. This monolithic microwave integrated circuit (MMIC) features six channels, again that’s four receivers and two transmitters, along with a microcontroller unit (MCU) and a digital signal processor (DSP) all on the same chip. The enables ultra-low unit cost and power consumption of 4.2W.

The electronic board is manufactured with an asymmetric structure using a hybrid PTFE/FR4 substrate, and is equipped with planar antennas.

With this new short-range radar generation, Ainstein has significantly decreased the volume and manufacturing cost of the sensor compared to competitor solutions.

The report contains a comparison with Delphi’s 76/77GHz Blind Spot Radar.

Based on a complete teardown analysis of the Ainstein radar, this report provides the bill-of-material (BOM) and the manufacturing cost of the radar sensor.

A complete physical analysis and a manufacturing cost estimation of Texas Instruments’ MMIC is available in a separate report.

COMPLETE TEARDOWN WITH
- Detailed photos
- Materials analysis
- Block diagram
- RF chipset
- PCB cross-section and materials analysis
- Complete and priced bill-of-materials
- Manufacturing process flow
- Manufacturing cost analysis
- Comparison with Delphi BSD Radar
- Estimated sales price
TABLE OF CONTENTS

Overview/Introduction

• Executive Summary
• Company Profile
• Reverse Costing Methodology

Physical Analysis

• Global View of the Radar
• Views and Dimensions of the Radar
• Radar Opening
• Electronic Board
• Global View
• High Definition Photo
• Component Markings and Identification
• Block Diagram
• RF Chipsets
• Packaging

Cost Analysis

• Board Cross Section and EDX Analysis
• PCB Cost
• BOM Cost – Electronic Board
• BOM Cost – Housing
• Material Cost Breakdown
• Accessing the Added Value (AV) cost
• Electronic Board Manufacturing Flow
• Details of the Housing Assembly
• Added Value Cost Breakdown
• Manufacturing Cost Breakdown
• Comparison with Delphi BSD Radar

Estimated Price Analysis

• Estimation of the Selling Price

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