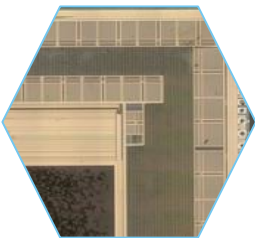




Triple Forward Camera from Tesla Model 3

Complete analysis of the main sensing part of the Tesla's autopilot system.



Tesla is preparing the best solution to offer a system to make a car truly autonomous, with the objective of reduction of accident and injury.

The Triple Forward Camera from Tesla Model 3 is mounted behind the windshield and provides broad visibility in front of the car.

This system captures front images over up to 250 meters that are used by the Tesla Model 3 Driver Assist Autopilot Control Module Unit. The system integrates a serializer but no computing.

Tesla chose dated but well known and reliable components with limited bandwidth, speed and dynamic range. This is probably due to the limited computing performance of the downstream Full Self-Driving chipset. This three-camera setup is therefore very far from the robotic autonomous vehicle (AV) technology used on Waymo and GM Cruise vehicles. The level of autonomy Tesla will achieve with this kind of hardware is the trillion-dollar question you will be able to assess with this report.

We assume this system is manufactured in the USA. It is an acquisition module without treatment

using three cameras, narrow, main and wide, with 3 CMOS Image Sensors with 1280x960 1.2Mp resolution.

Based on a complete teardown analysis, the report provides the bill-of-material (BOM) and the manufacturing cost of the Triple Forward Camera from Tesla Model 3.

The report also includes a physical analysis of the CMOS image Sensor from ON Semiconductor subsidiary Aptina.

Also, the complete cost analysis and a selling price estimation are calculated.

COMPLETE TEARDOWN WITH

- Detailed photos
- Block diagram
- Lens module cross section
- PCB cross-section and cost estimation
- Die pictures and cost estimations of the CMOS image sensor
- Complete and priced bill-of-materials
- Manufacturing process flow
- Manufacturing cost analysis
- Estimated sales price

Title: Triple Forward Camera from Tesla Model 3

Pages: 80

Date: January 2020

Format: PDF & Excel file

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AUTHOR



Philippe Vandar has joined System Plus Consulting as a Costing Analyst in Electronic Systems in 2018.

He is in charge of reverse costing, with a focus on electronic boards and systems.

He previously worked for PSA Group, where he was in charge of costing systems including air bag electronic crash units (ECUs), window lifter command systems, radio frequency supervisor boxes, and park assist systems.

He holds an HCN in Industrial Mechanics and Automation from the MECAGIM Institute.

RELATED REPORTS



Aptiv's Lane Assist Front Camera for Audi A8

A new monocular front camera delivering image signals from the area in front of the car and classifying objects.

January 2020



Denso's Monocular Forward ADAS Camera in the Toyota Alphard

Denso has developed a new monocular forward camera for improved night vision, using Sony's high-sensitivity 1.27M-pixel image sensor and Toshiba's new advanced image recognition processor.

January 2020

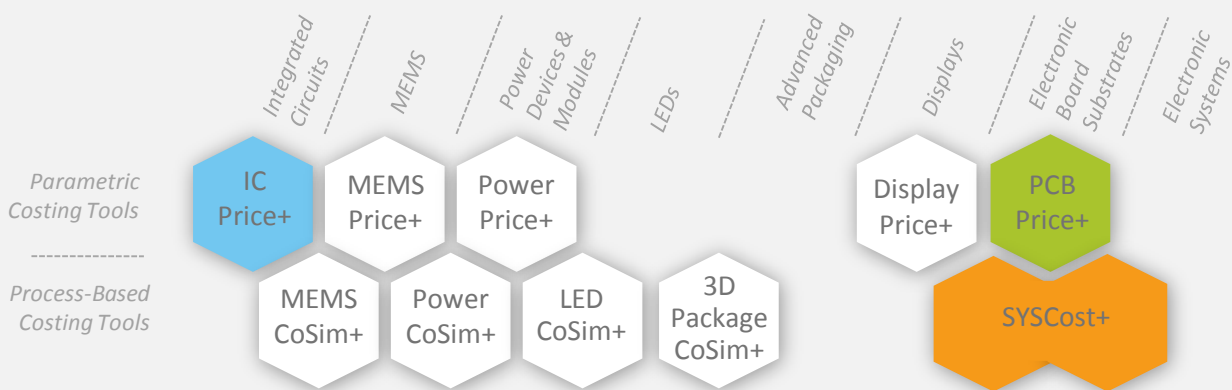


ZF S-Cam 4 – Forward Automotive Mono and Tri Camera for Advanced Driver Assistance Systems

Fourth generation of the S-Cam family from the leading ADAS camera player.

May 2019

COSTING TOOLS



Our analysis is performed with our costing tools SYSCost+, IC Price+ and PCB Price+. System Plus Consulting offers powerful costing tools to evaluate the production cost and selling price from single chip to complex structures.

SYSCost+

Provides all component costs estimation including PCB, housing and connectors, and a simulation of the assembly cost and test process at the board and system level.

IC Price+

Performs the necessary cost simulation of any Integrated Circuit: ASICs, microcontrollers, memories, DSP, smartpower...

PCB Price+

Performs the necessary cost simulation of a large type of PCB substrates according to different technical characteristics such as the material, the metal layers, the type of Vias, etc.

WHAT IS A REVERSE COSTING®?

Reverse Costing® is the process of disassembling a device (or a system) in order to identify its technology and calculate its manufacturing cost, using in-house models and tools.



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ABOUT SYSTEM PLUS CONSULTING

System Plus Consulting is specialized in the cost analysis of electronics from semiconductor devices to electronic systems. A complete range of services and costing tools to provide in-depth production cost studies and to estimate the objective selling price of a product is available.

Our services:

- **STRUCTURE & PROCESS ANALYSES**
- **TEARDOWNS**
- **CUSTOM ANALYSES**
- **COSTING SERVICES**
- **COSTING TOOLS**
- **TRAININGS**

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System Plus Consulting may change its prices whenever the company thinks it necessary. However, the company commits itself in invoicing at the prices in force on the date the order is placed.

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