

**MISTRAL**  
... Partners in Real Time



# Sensor Fusion Kit

## Integrated Camera Vision & mmWave RADAR

### OVERVIEW

The Sensor Fusion Kit from Mistral is an integrated, easy to use Camera Vision and mmWave RADAR platform providing high functionality for automotive ADAS applications.

Based on Texas Instruments ultra-high-resolution single chip 77GHz mmWave RADAR (AWR1443/1843) and TDA3 SoC for Vision Analytics, the platform provides an integrated Camera with RADAR Fusion Processing offering the accuracy and redundancy required for safety applications.

The Sensor Fusion kit (Camera Vision + mmWave RADAR) is uniquely designed to provide extreme range precision along with superior imaging capabilities. The platform provides advanced ADAS experience using Vision Analytics and RADAR data fusion in real-time.

The Kit consists of:

**Processor Board:** Performs Object Detection, Classification, Identification and Annotates Video stream with RADAR Range data. Also provides automotive and power interfaces to integrate with end product environment.

**mmWave RADAR Module:** Consists of FMCW Transceiver with Integrated PLL, Baseband ADC, R4F controller with accelerator, SPI flash, DSP etc.

**Camera Sensor Board:** CSI based 1.3M CMOS HD image sensor supporting upto 60 fps.

The Kit includes starterware and sample applications for common automotive RADAR/Camera usages. It also provides debug interfaces for test and development.

The RADAR module has Built-in Self-test and Self-calibrating RF section that addresses safety, aging and temperature-based variations.

The modular design and size of the hardware enables customers to design optimized enclosures to suit specific applications.

The platform delivers synchronized Point Cloud and Video data.

- ▶ The Point cloud data consisting of Object's ID, Range, Angle, Velocity and Signal strength is delivered over Serial/CAN interface.
- ▶ The Video data includes camera stream Annotated with objects identified, classified and RADAR range over HDMI/Ethernet interface.

The Sensor Fusion Kit is available with three antenna variants to cater to different ADAS applications.

- ▶ Ultra-short Range (ODS)
- ▶ Short Range (Three Elements)
- ▶ Mid Range (Tapered Elements)



### FEATURES



**Heterogeneous and scalable platform**



**Compact Modular Design**



**DSP and large memory**



**Camera Sensor**



**GigE and CAN Interface**

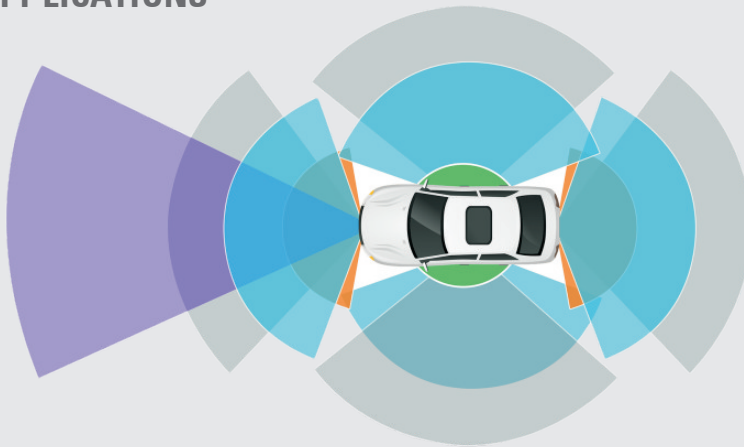


**Fusion Vision Analytics**



**ASIL Targeted**

## APPLICATIONS



- ▶ Object Detection
- ▶ Pedestrian Detection
- ▶ Traffic Sign Recognition
- ▶ Lane Detection and Departure Warning
- ▶ Lane Tracking
- ▶ Drive Recording
- ▶ Automatic Emergency Braking
- ▶ Adaptive Cruise Control
- ▶ Forward Collision Warning
- ▶ Parking Assist

## SPECIFICATIONS

- ▶ TDA3 SoC for Vision Analytics
- ▶ mmWave RADAR
  - FMCW Transceiver
  - 76 to 81GHz Coverage with 4GHz available Bandwidth
  - ARM® Cortex R4F-Based Radio Control System
  - Built-in Calibration and Self-test
- ▶ Camera
  - CSI2 Camera interface
  - Tested with Ov10640 WDR Camera Module from Leopard Imaging\*
- ▶ Memory: 2GB DDR3/32GB SD Card
- ▶ Peripherals support: GigE, HDMI, Dual CAN, 2SPI Channels, 2UARTs, I2C, GPIOs, JTAG and 2-Lane LVDS (for RF Board) Interface for Raw ADC Data and Debug (DCA1000)
- ▶ Power: 7 to 18V Automotive Power Input
- ▶ Operating Temperature: -40°C to 85°C
- ▶ Dimension: 76 x 115 mm

- ▶ Starterware
  - Object Classification and Identification
  - Video stream annotation with RADAR Range data

\* Can be interfaced with other 3<sup>rd</sup> party camera sensors

## CUSTOMIZATION

Mistral offers customization services to automotive customers for a wide range of ADAS and other automotive applications. Mistral can provide customization services to support RADAR Drivers and Integration, Chirp Profile Tuning, Multi-Core SoC Application Development, RADAR Integration with Camera Fusion, FCC / CE Certification, Thermal Validation and System Integration based on customer specific requirement.

## WHAT YOU WILL GET

- ▶ Sensor Fusion Kit
- ▶ Quick Start Guide
- ▶ Software Package and Documentation (Online)



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