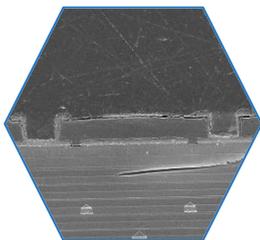
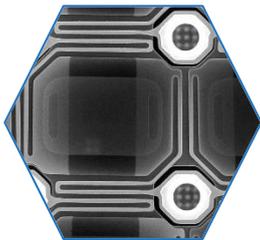
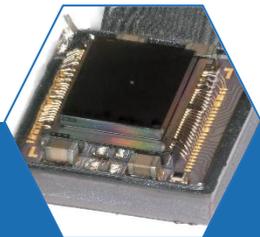




Guide Infrared's 17µm Microbolometer Module

Chinese's first low-definition microbolometer for integration into consumer applications.



Title: Guide Infrared Module 17µm Microbolometer

Page: 119

Date: September 2020

Format: PDF & Excel file

Price: EUR 3,990

Reference: SP20567

Founded in 1999, Guide Infrared is now a leader in infrared technology in China and in the world. After developing microbolometer dies, thermal imagers for military, industry and security, Guide Infrared and Global Sensor Technology have developed a tiny module with low pixel count for smartphones. The Guide Infrared module is a direct competitor to Flir's Lepton3 thermal cameras and the Seek Thermal smartphone module.

Guide Infrared has a broad range of products from thermal camera plug-ins for smartphones to focal plane array detectors, cores and thermal cameras for military. All the products integrate their uncooled detector die. Today, the 17µm and 12µm microbolometers are the most used sensors in Guide products.

This full reverse costing study has been conducted to provide insight into technology design, the manufacturing cost and selling price of microbolometer detector GST117W and the infrared module with the ceramic substrate, the plastic support and the infrared lens. Guide has selected O-Film, the leader in the camera module assembly, to make the module.

The microbolometer use vanadium oxide technology and a 17µm pixel width.

The integration into a 680mm³ volume is allowed by the wafer level package technology developed by Guide. With a definition of 120x90 pixels, the microbolometer is designed for consumer low definition markets, including smartphones, pocket thermal imagers and intelligent buildings.

Along with the complete technical analysis of the microbolometer components, this report includes a technical and cost comparison between Guide Infrared Module, Flir Lepton 3 and IRay RTD3172.

COMPLETE TEARDOWN WITH

- Analysis of the microbolometer module, including microbolometer die, module and lens
- Detailed optical and SEM photos
- Precise measurements
- Supply chain evaluation
- Manufacturing cost analysis
- Estimated selling price
- Technology comparisons between the Guide Infrared Module, IRay RTD3172 17µm and Flir Lepton 3

TABLE OF CONTENTS

Overview/Introduction

- Executive Summary
- Reverse Costing Methodology

Company Profile and Market Analysis

Physical Analysis

- Summary of the Physical Analysis
- Guide Infrared Module
 - ✓ Package views
 - ✓ Die overview and dimensions
 - ✓ Die process
 - ✓ Die cross-section
 - ✓ Die process characteristics

Manufacturing Process Flow

- GST117W
- Global Overview
- ROIC Wafer
- Microbolometer Wafer
- Process Flow

Cost Analysis

- Yield Explanations and Hypotheses
- ROIC Front-End Cost
- Microbolometer Wafer and Die Cost
- IR Window Cost
- Package Cost
- Component Cost

Price Estimation

Technical and Cost Comparison

- Guide Infrared Module, Flir Lepton 3, IRay RTD3172

AUTHORS

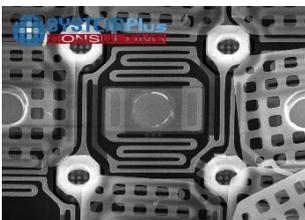


Sylvain Hallereau has been Project Manager at System Plus Consulting since 2000. He is in charge of costing analyses for Integrated Circuits, Power semiconductors and LEDs. He has significant experience in the modeling of manufacturing costs for electronics components, Sylvain holds a Master degree in Microelectronics from the University of Nantes, France.



Dr. Youssef El Gmili has joined System Plus Consulting's team in 2019 after ten years passed on high level research and development on microelectronics. He has a deep knowledge in the study and analysis of semiconductors Materials. He holds a Master Degree in Microelectronics, and a Phd in Physics/Materials Science.

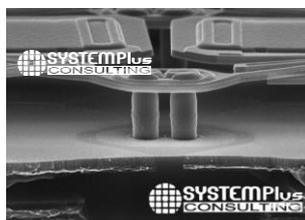
RELATED REPORTS



IRay Technology 12 μ m and 17 μ m Thermal Sensors

Comparison between 12 μ m and first and second generation 17 μ m LWIR microbolometers from Chinese manufacturer IRay Technology's.

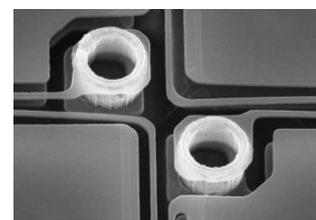
August 2020 - EUR 3,990*



FLIR Boson – small, innovative, low power, smart thermal camera core

Based on a high definition ISC1406L micro-bolometer, the FLIR Boson thermal camera aims at a wide range of markets: military, drones, automotive, security and firefighting.

September 2017 - EUR 3,490*

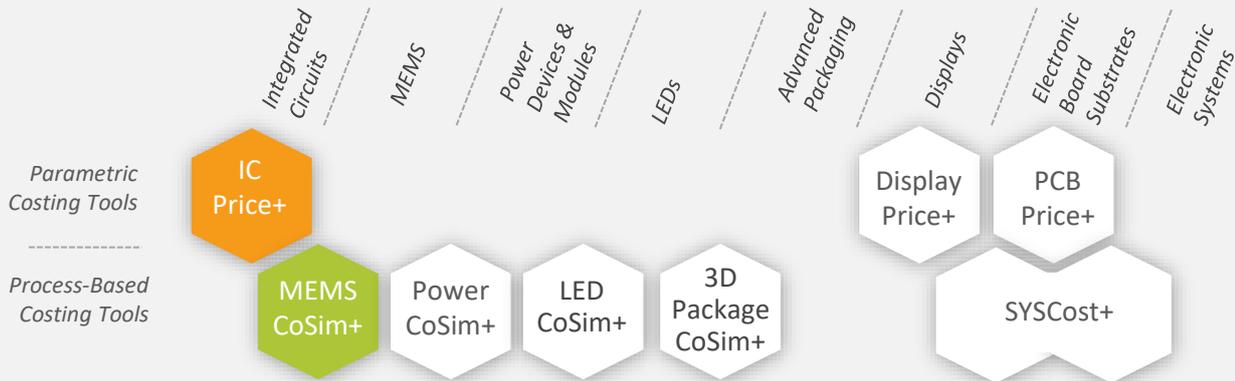


Thermal Expert Infrared Camera for Smartphones

Based on a high definition microbolometer from I3system, the Thermal Expert infrared camera is a high-end product for smartphones.

August 2016 - EUR 3,490*

COSTING TOOLS



Our analysis is performed with our costing tools IC Price+ and MEMS CoSim+.

System Plus Consulting offers powerful costing tools to evaluate any process or device, the production cost and selling price, from single chip to complex structures. All these tools are on sale under corporate license.

MEMS CoSim+

The costing tool is process-based to evaluate the manufacturing cost per wafer using your own inputs or using the pre-defined parameters included in the tool.

IC Price+

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

ABOUT SYSTEM PLUS CONSULTING

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.



CONTACTS

Headquarters

22, bd Benoni Goullin
Nantes Biotech
44200 Nantes
France
+33 2 40 18 09 16
sales@systemplus.fr

Europe Sales Office

Lizzie LEVENEZ
Frankfurt am Main
Germany
+49 151 23 54 41 82
llevenez@systemplus.fr

America Sales Office

Steven LAFERRIERE
Western USA & Canada
+1 310-600-8267
laferriere@yole.fr

Chris YOUMAN
Eastern USA & Canada
+1 919-607-9839
chris.youman@yole.fr

Asia Sales Office

Takashi ONOZAWA
Japan & Rest of Asia
+81 80 4371 4887
onozawa@yole.fr

Mavis WANG
Greater China
TW +886 979 336 809
CN +8613661566824
wang@yole.fr

Peter OK
Korea
+82 10 4089 0233
peter.ok@yole.fr

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**
- **TEARDOWN TRACKS**
- **CUSTOM ANALYSES**
- **COSTING SERVICES**
- **COSTING TOOLS**
- **TRAININGS**

www.systemplus.fr
sales@systemplus.fr

TERMS AND CONDITIONS OF SALES

1. INTRODUCTION

The present terms and conditions apply to the offers, sales and deliveries of services managed by System Plus Consulting except in the case of a particular written agreement.

Buyer must note that placing an order means an agreement without any restriction with these terms and conditions.

2. PRICES

Prices of the purchased services are those which are in force on the date the order is placed. Prices are in Euros and worked out without taxes. Consequently, the taxes and possible added costs agreed when the order is placed will be charged on these initial prices.

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.

3. REBATES and DISCOUNTS

The quoted prices already include the rebates and discounts that System Plus Consulting could have granted according to the number of orders placed by the Buyer, or other specific conditions. No discount is granted in case of early payment.

4. TERMS OF PAYMENT

System Plus Consulting delivered services are to be paid within 30 days end of month by bank transfer except in the case of a particular written agreement.

If the payment does not reach System Plus Consulting on the deadline, the Buyer has to pay System Plus Consulting a penalty for late payment the amount of which is three times the legal interest rate. The legal interest rate is the current one on the delivery date. This penalty is worked out on the unpaid invoice amount, starting from the invoice deadline. This penalty is sent without previous notice.

When payment terms are over 30 days end of month, the Buyer has to pay a deposit which amount is 10% of the total invoice amount when placing his order.

5. OWNERSHIP

System Plus Consulting remains sole owner of the delivered services until total payment of the invoice.

6. DELIVERIES

The delivery schedule on the purchase order is given for information only and cannot be strictly guaranteed. Consequently any reasonable delay in the delivery of services will not allow the buyer to claim for damages or to cancel the order.

7. ENTRUSTED GOODS SHIPMENT

The transport costs and risks are fully born by the Buyer. Should the customer wish to ensure the goods against lost or damage on the base of their real value, he must imperatively point it out to System Plus Consulting when the shipment takes place. Without any specific requirement, insurance terms for the return of goods will be the carrier current ones (reimbursement based on good weight instead of the real value).

8. FORCE MAJEURE

System Plus Consulting responsibility will not be involved in non execution or late delivery of one of its duties described in the current terms and conditions if these are the result of a force majeure case. Therefore, the force majeure includes all external event unpredictable and irresistible as defined by the article 1148 of the French Code Civil?

9. CONFIDENTIALITY

As a rule, all information handed by customers to system Plus Consulting are considered as strictly confidential. A non-disclosure agreement can be signed on demand.

10. RESPONSABILITY LIMITATION

The Buyer is responsible for the use and interpretations he makes of the reports delivered by System Plus Consulting. Consequently, System Plus Consulting responsibility can in no case be called into question for any direct or indirect damage, financial or otherwise, that may result from the use of the results of our analysis or results obtained using one of our costing tools.

11. APPLICABLE LAW

Any dispute that may arise about the interpretation or execution of the current terms and conditions shall be resolved applying the French law.

If the dispute cannot be settled out-of-court, the competent Court will be the Tribunal de Commerce de Nantes.