



System Solution Guide - Preview

# Security and Portable Cameras



onsemi.com



# Table of Contents

Get Latest  
Version

## Overview

Application

03

## Market Information & Trend

Emerging Technologies in Security and Surveillance Cameras

05

Emerging Technologies in Portable Camera Systems

06

## System Implementation

Portable Batter-operated Camera Systems

07

Types of Security Cameras

08

Low Power Consumption Image Sensor Families

09

WoM – Cost-Effective Security Solutions Without PIR Technology

10

Advanced HDR Capabilities of **onsemi's** Hyperlux LP and LH Image Sensor Families

11

## Solution Overview

Block Diagram – Security and Surveillance Camera

12

Block Diagram – Portable Cameras

13

Hyperlux Image Sensing Portfolio

14

Hyperlux LP - Image Sensor Family

15

Additional Hyperlux LP Family Features

18

Hyperlux LH - Image Sensor Family

19

## Recommended Products

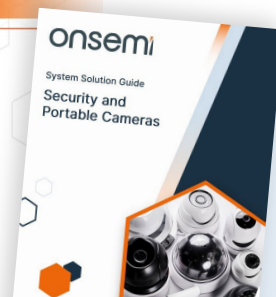
Hyperlux LH and LP f

21

## Complementary Products

22

onsemi™



Register now to unlock all System Solution Guides



1



2



3



4



5



6



7



8



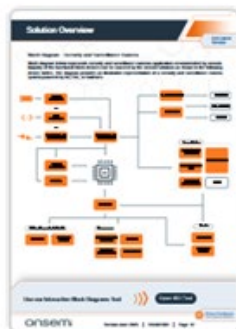
9



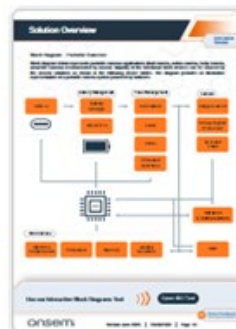
10



11



12



13



14



15



16



17



18



19



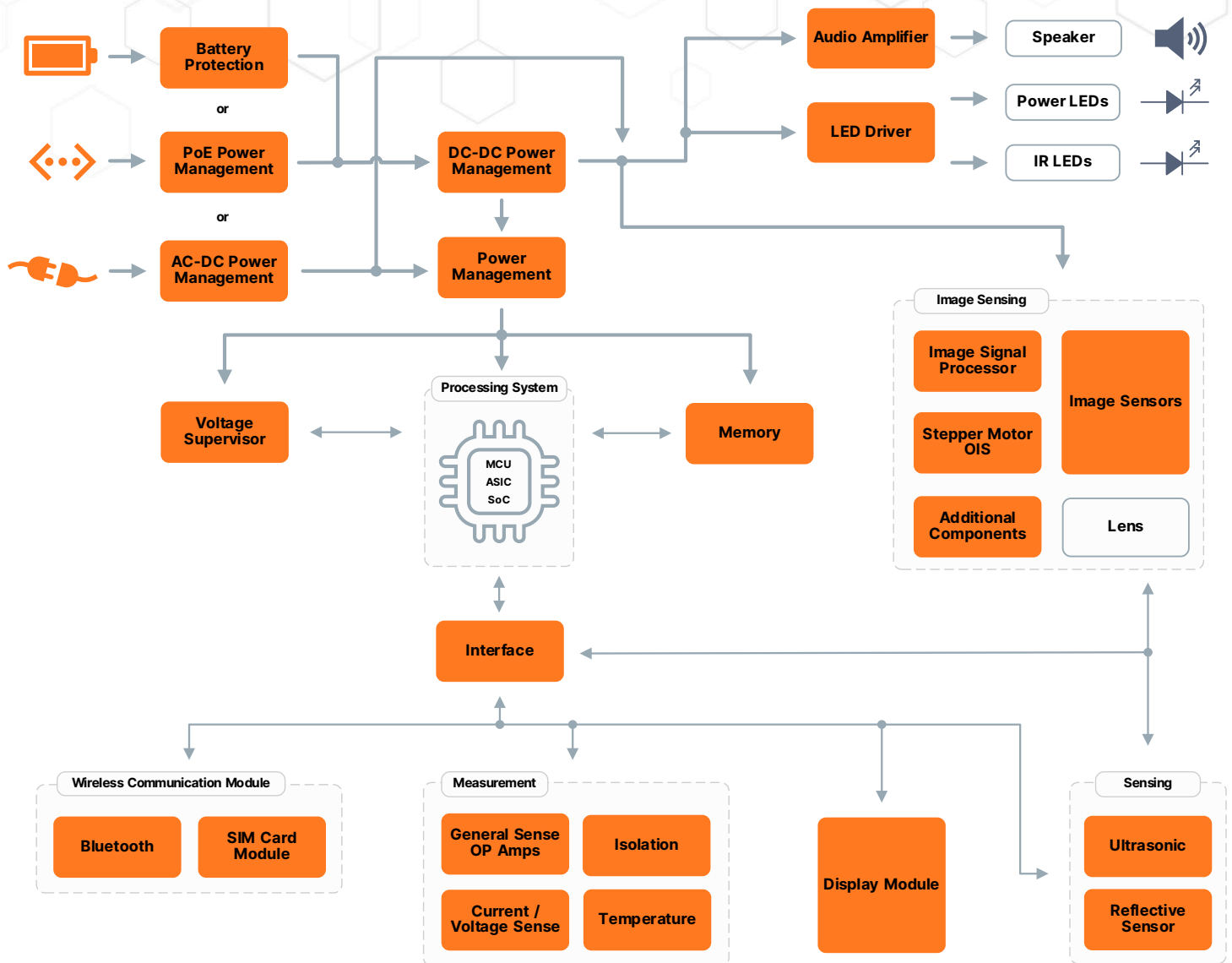
20

# Block Diagram

Get Latest  
Version

## Block Diagram – Security and Surveillance Camera

Block diagram below represents security and surveillance cameras application recommended by onsemi. Majority of the functional block devices can be sourced by the onsemi solutions as shown in the following device tables. The diagram provides an illustrative representation of a security and surveillance camera system powered by AC, PoE, or batteries.



Use our Interactive Block Diagrams Tool



Open IBD Tool

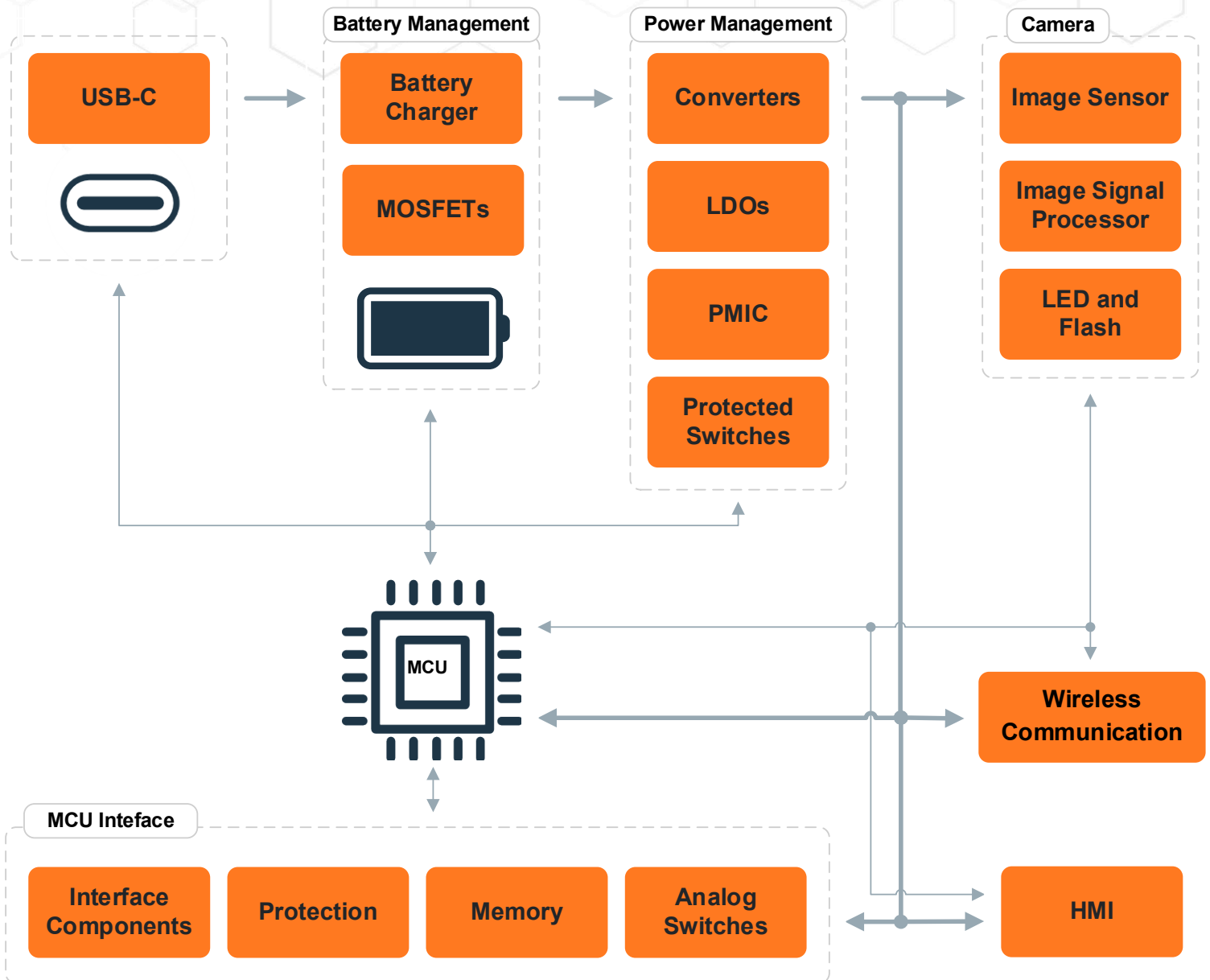


# Block Diagram

Get Latest  
Version

## Block Diagram – Portable Cameras

Block diagram below represents portable cameras applications (trail camera, action camera, body camera, wearable camera) recommended by **onsemi**. Majority of the functional block devices can be sourced by the **onsemi** solutions as shown in the following device tables. The diagram provides an illustrative representation of a portable camera system powered by batteries.



Use our Interactive Block Diagrams Tool



Open IBD Tool

## Hyperlux LP - Image Sensor Family

Recently, **onsemi** launched the Hyperlux™ LP series of image sensors. This series incorporates cutting-edge electronic rolling shutter technology and consists of three product variants: the [AR0544](#) with a resolution of 5MP, the [AR0830](#) with 8.3MP, and the [AR2020](#) with 20MP. All sensors within the Hyperlux™ LP family feature identical pixel sizes and optical performance. The product lines provide a variety of options, including mono, RGB, and RGBIR variants, available in both packaged and die forms. This extensive selection allows vision system designers to optimize development efforts, reduce expenses, and accelerate time-to-market (TTM) by leveraging diverse solutions.

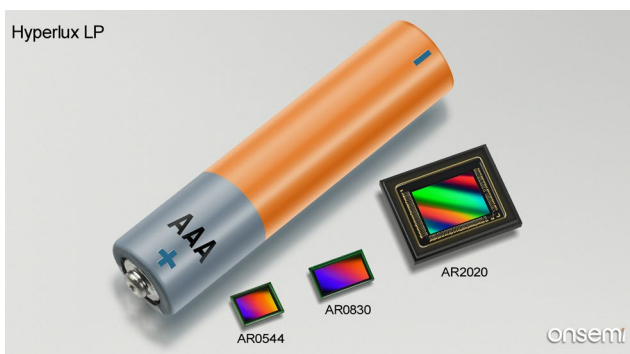
	AR0544	AR0830	AR2020
Resolution	5MP, 2592 x 1944	8 MP, 3840 x 2160	20 MP, 5120 x 3840
Pixel, Color Filter	1.4 μm BSI, RGB/Mono/RG B-IR	1.4 μm BSI, RGB/Mono/ RGB-IR	1.4 μm BSI, RGB/Mono
Optical Format	1/4.2-inch (4:3)	1/2.9-inch (16:9)	1/1.8-inch (4:3)
SNR - Max	39.9 dB		
Dynamic Range	73 dB (eDR 1-exp)		
Subsampling Modes	Binning/Skipping/Summing		

### Power Consumption

- In the pre-detect state, Hyperlux™ LP image sensors consume less than 1/100th of the power consumed in the native mode. This results in substantial power savings and extends the operational cycle of vision systems that are sensitive to power consumption.

Table 2: Image sensor power consumption comparison in full resolution mode

	AR0544	AR0830	AR2020
Power Consumption (Full Resolution, Typical 25C)	< 170 mW @ 60 fps	190 mW @ 60 fps	~400 mW @ 60 fps



### Ultra Low Power Operation

- Improves battery life by 2x over existing architectures
- Wake-on-Motion Mode < 2mW
- 2x battery life over competitors

### High Performance Imaging

- Low-light: Superior 1.4 um BSI pixel
- NIR: 45% QE at 850 nm
- Speed: Up to 20 MP at 60 fps

## Hyperlux LH - Image Sensor Family

The **onsemi Hyperlux LH** family of image sensors is engineered to deliver superior performance for security and surveillance cameras, ensuring high-quality imaging across diverse lighting conditions. These sensors feature an industry-leading 150dB ultra-high dynamic range (HDR), which allows them to capture detailed images even in extreme lighting contrasts. The enhanced near-infrared (NIR) sensitivity is optimized for low-light and night-time surveillance, providing clear visuals in conditions where traditional sensors might fail. Additionally, the advanced LED Flicker Mitigation (LFM) technology effectively eliminates the flickering effects caused by LED lighting, ensuring consistent image quality.



Supporting 4K video resolution, the Hyperlux LH sensors deliver ultra-high-definition images, which are crucial for identifying fine details in security footage. The sensors are designed with a 2.0  $\mu\text{m}$  pixel size, contributing to their high sensitivity and image clarity. Furthermore, these sensors are built for low power consumption, making them ideal for battery-operated devices and reducing overall energy costs in surveillance systems.

The combination of these features ensures that security and surveillance cameras equipped with Hyperlux LH sensors can provide reliable, high-quality visual data essential for effective monitoring and security operations. **The onsemi Hyperlux LH** image sensor family is a standout in its category, particularly when it comes to power consumption and HDR capabilities. As highlighted in the comparison table 3, the Hyperlux LH sensors consume only 383W, which is significantly lower than competitors under the same conditions.




Table 3: Power consumption comparison

	onsemi AR0822	Competitor A	Competitor B
HDR @ 30 fps	eHDR 120dB/ Li- HDR/ eDR	DOL (LI-HDR)	LI-HDR 85dB
Power	383mW @ 60 fps	523mW	792mW @ 60 fps

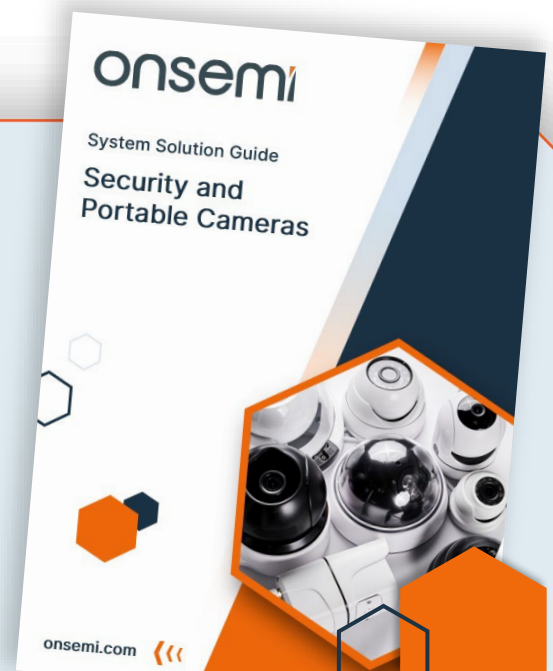
# onsemi™

## Intelligent Technology. Better Future.

**Register now to unlock all System Solution Guides and get additional exclusive benefits!**

-  Join the conversation on community forum.
-  Utilize Elite Power Simulator & other developer tools.
-  Watch exclusive webinars and seminars.

**Open full System Solution Guide**



onsemi, the onsemi logo, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using onsemi products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by onsemi. "Typical" parameters which may be provided in onsemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. onsemi does not convey any license under any of its intellectual property rights nor the rights of others. onsemi products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use onsemi products for any such unintended or unauthorized application, Buyer shall indemnify and hold onsemi and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that onsemi was negligent regarding the design or manufacture of the part. onsemi is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.