

Ultra small reflowable CIF+ camera module

Data Brief

Features

- CIF+ resolution sensor (384x320 or 320x384)
- Electrical and logical interface fully SMIA compliant
- Video data interface - CCP2.0
- Command interface - CCI
- 2.8 V/1.8 V operation
- On-board 10-bit ADC
- Small physical size
- Integral EMC shielding
- Ultra low power standby mode
- On-chip PLL
- Lead free reflowable module

Description

This VS6451 is an ultra small reflowable CIF+ camera module for use across a range of mobile phone handsets and accessories. It is primarily designed to be used as a second camera in video conferencing applications, but it may also be used as a primary camera. The camera sensor is SMIA class 2 profile 0 compliant and is capable of generating raw bayer CIF+ images up to 30 fps. The VS6451 supports the CCI control and CCP2.0 data interfaces.

As different phone platforms have different baseband processors with varying capabilities, it may not be possible for all phones to support the associated image processing algorithms. Where the baseband cannot support this processing load, a separate hardware accelerator (STV0976 or STV0984) device can be incorporated in the phone system to run the algorithms in hardware.

The STV0984 processor can support 2 cameras. The specifications of these devices are contained in a separate document.



The module design is optimized to provide an ultra small footprint and height, and is designed to be reflowable at lead-free solder profiles. The product is lead free.

The lens design is optimized for video conferencing and maintains its performance even after the high temperatures of lead-free reflow.

VS6451 offers an ultra low power consumption hardware standby mode consuming less than 30 μ W.

Applications

- Mobile phone
- PDA
- Videophone

Order code

Part number	Package
VS6451R0BA/T2	Lead-free reflowable module

Figure 1. Application diagram

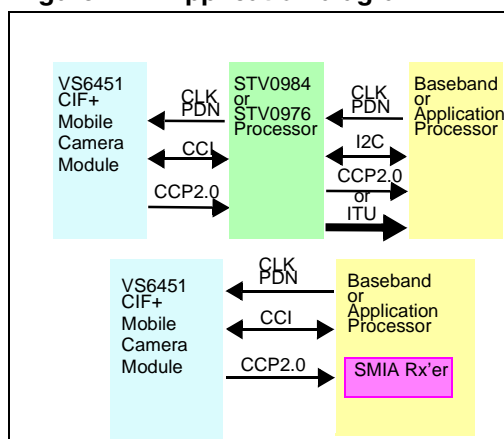


Figure 2. Block diagram

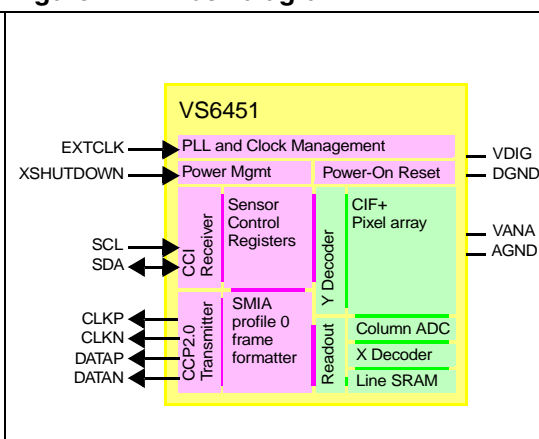
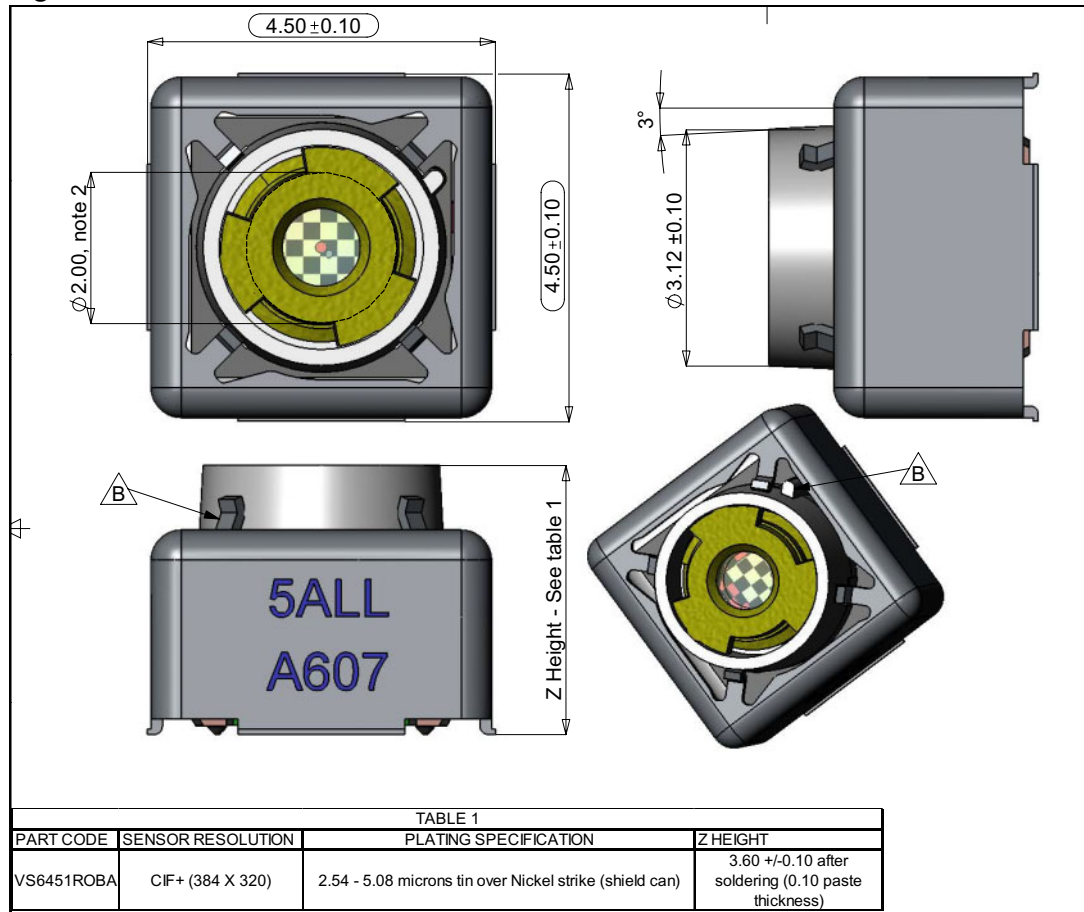


Table 1. Technical specifications

Parameter	Values
Pixel array	CIF+ portrait and landscape
Sensor technology	0.18 μm HCMOS8i shrink
Pixel size	3.6 μm x 3.6 μm
Exposure control	+8 dB
Analogue gain	+24 dB (max)
Dynamic range	61 dB
Signal to noise	34 dB (@ 100 lux)
Minimum illumination	< 7lux
Supply voltage	Analogue: 2.4V to 2.9V Digital: 1.8V \pm 0.1V
Average power consumption @ 30fps	<60 mW
Module size (XYZ) max	4.5 mm x 4.5 mm x 3.6 mm
Lens HFOV	45° +/- 2° (CIF+, CIF equiv. 45°)
F number	2.8
Lens SFR	On axis 45% (typ) Horizontal field (70%) 25% (typical)
Lens TV distortion	< 5%
Relative illumination	60% (typ)
System connectivity	Lead free reflowable BGA
Storage temperature	[-40; +85]°C
Functional operating temperature	[-30; +70]°C
Normal operating temperature	[-25; +55]°C
Optimal operating temperature	[+5; +30]°C

Figure 3. Mechanical data



Revision history

Table 2. Document revision history

Date	Revision	Changes
26-Apr-2006	1	Initial release.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED REPRESENTATIVE OF ST, ST PRODUCTS ARE NOT DESIGNED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS, WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2006 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com