

## 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.

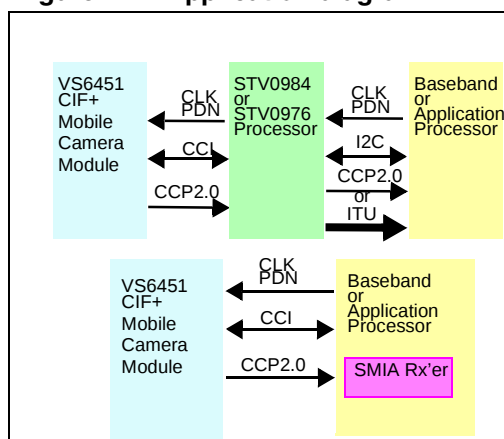
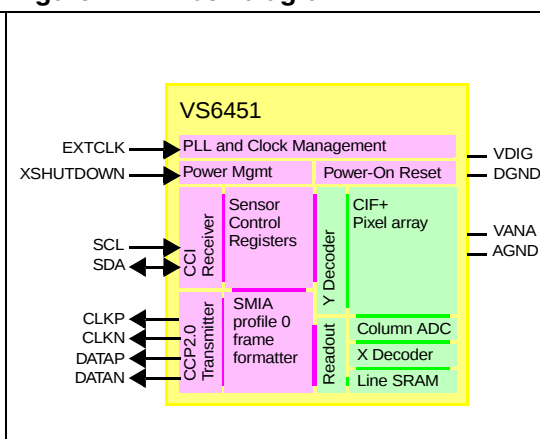
VS6451 offers an ultra low power consumption hardware standby mode consuming less than 30  $\mu$ W.

### Applications

- Mobile phone
- PDA
- Videophone

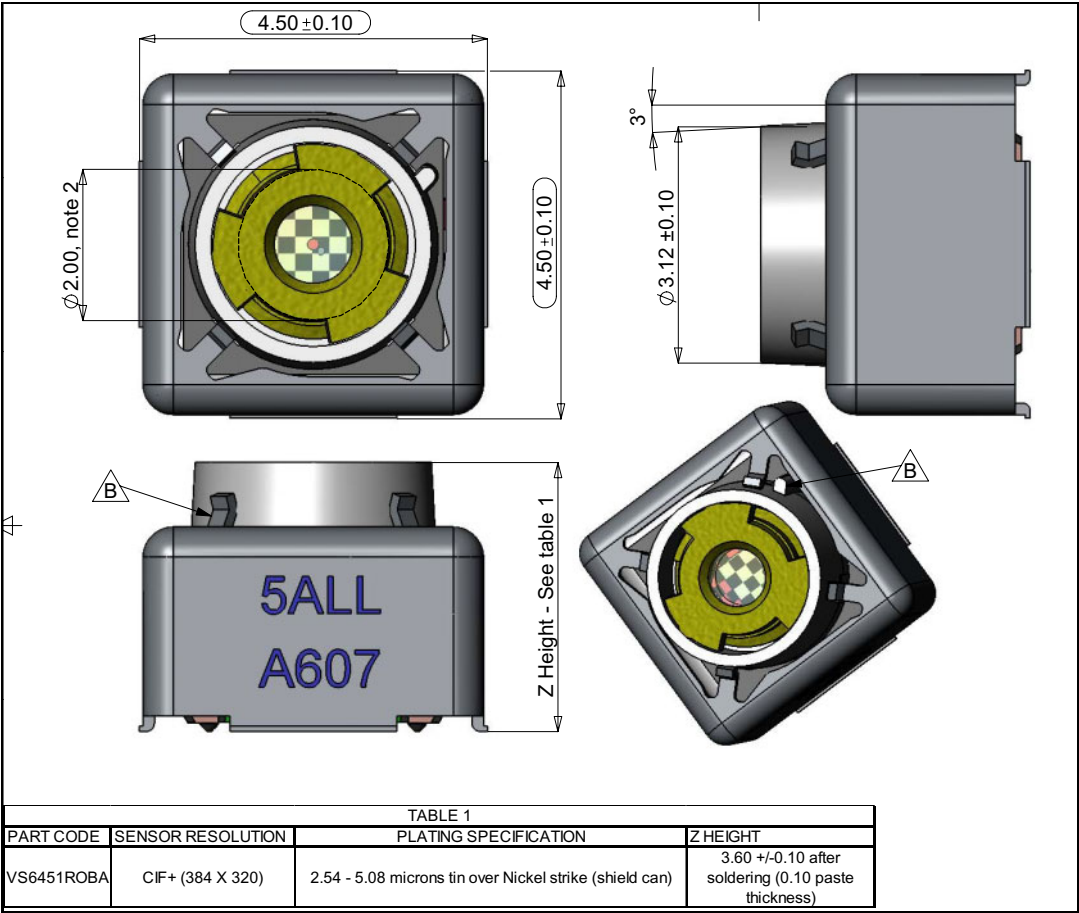
### Order code

| 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 $\mu\text{m}$ HCMOS8i shrink                         |
| Pixel size                        | 3.6 $\mu\text{m}$ x 3.6 $\mu\text{m}$                     |
| 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<br>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° $\pm$ 2°<br>(CIF+, CIF equiv. 45°)                    |
| F number                          | 2.8                                                       |
| Lens SFR                          | On axis 45% (typ)<br>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. |

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