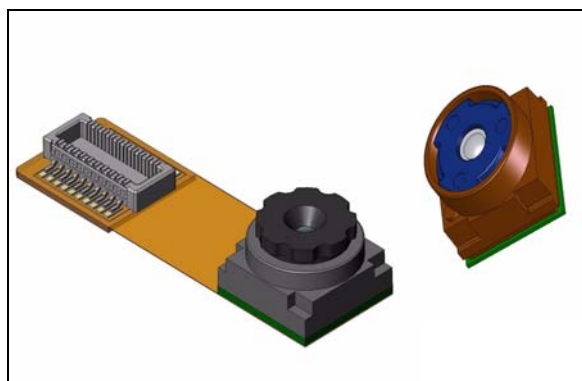


## 2 Megapixel single-chip camera module

Data Brief

### Features

- 1600H x 1200V active pixels
- Class leading 30fps UXGA progressive scan
- 2.2µm pixel size, 1/3.8 inch optical format
- RGB Bayer color filter array
- Integrated 10-bit ADC
- Integrated digital image processing functions, including defect correction, lens shading correction, image scaling, color interpolation, radial peaking, gamma correction and color space conversion
- Embedded hardware JPEG controller delivering 30fps streaming performance
- Embedded camera controller for automatic exposure control, automatic white balance control, black level compensation, 50/60 Hz flicker detection and cancelling, flashgun support.
- Fully programmable frame rate and output derating functions
- Low power 30fps SVGA, VGA progressive scan for video capture
- ITU-R BT.656-4 YUV (YCbCr) 4:2:2 with embedded syncs, YUV (YCbCr) 4:0:0, RGB 565, RGB 444, Bayer 10-bit or Bayer 8-bit output formats
- 8-bit parallel video interface, horizontal and vertical syncs, 80MHz (max) clock
- Two-wire serial control interface
- On-chip PLL, 6.5 to 27MHz clock input
- Analog power supply, from 2.4V to 3.0V
- Separate I/O power supply, 1.8V or 2.8V levels
- Integrated power management with power switch, automatic power-on reset and power-safe pins
- Low power consumption, ultra low standby current



- Four-element plastic lens, F# 3.2
- 20-wire FPC attachment with board-to-board connector, 22mm total length, head dimensions 8.0 x 8.0 x 5.61mm
- 24-pin 8.0 x 8.0 x 5.55mm shielded socket module with embedded passives. Compatible with SMK CLE9124-1501F

### Description

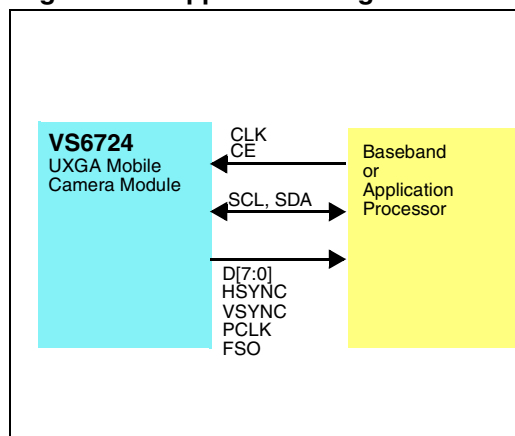
The VS6724 is a CMOS color digital camera featuring low size and low power consumption for mobile applications (PDA, mobile phones). Manufactured using ST 0.13µm CMOS Imaging process, it integrates a high-sensitivity pixel array, a digital image processor and camera control functions.

The VS6724 is capable of streaming UXGA video up to 30fps, with ITU-R BT.656-4 YUV 4:2:2 frame format, and M-JPEG compression. VS6724 also supports the output of uncompressed video data at UXGA resolution at up to 15 fps. It supports 1.8V/2.8V interface and requires a 2.4V to 3.0V analog power supply. If required, the VS6724 can operate as a 2.8V single supply camera. The integrated PLL allows for low frequency system clock, and flexibility for successful EMC integration.

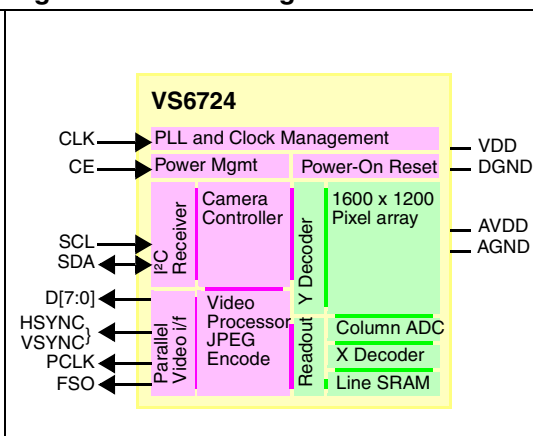
This complete camera module is ready to connect to camera enabled baseband processors, back-end IC devices or PDA engines.

The VS6724 camera module uses ST's 2<sup>nd</sup> generation of "SmOP2" packaging technology: the sensor, lens and passives are assembled, tested and focused in a fully automated process, allowing high volume and low cost production. The VS6724 benefits from a highly performant 4-element plastic lens offering the best in class optical performance in a state of the art low profile package.

**Figure 1. Application diagram**



**Figure 2. Block diagram**



**Table 1. Technical specifications**

Active pixels	1600H x 1200V
Pixel size	2.2 x 2.2µm
Array size	3.52mm x 2.64mm
Color filter array	RGB Bayer
Exposure control	+120dB
Analog gain	+24dB (max)
Dynamic range	61dB (typical)
Signal-to-noise Ratio	35 dB at 100 lux (typical)
Frame rate	1 to 15Hz UXGA (YUV/RGB) 1 to 30Hz UXGA (JPEG) 1 to 30Hz SVGA 1 to 30Hz VGA
Image format	UXGA, VGA, full image scaling up to x20 XY downscale Arbitrary cropping Horizontal/vertical flipping
Data format	JPEG YUV 4:2:2, YUV 4:0:0 RGB 565, RGB 444 Raw Bayer 10-bit Raw Bayer 8-bit
Video interface	8-bit parallel video, hsync, vsync ITU-R BT.656-4 compliant, 80MHz max

**Table 1. Technical specifications (continued)**

Clock input	6.5 to 27MHz square 13MHz typ. (on-chip PLL)
Supply voltage	2.4V to 3.0V analog
I/O voltage	1.8V or 2.8V +/- 0.1V CMOS levels
Power consumption (maximum)	Streaming 30fps inc JPEG encode: 265mW Power down: 10µA
Package type	SmOP2
Package size	8.0 x 8.0 x 5.5 mm (wlh)
System attach	– FPC with 20-pin B2B connector, Molex 55560-0201 or equivalent <sup>(1)</sup> – Compatible with SMK CLE9124-1501

1. Contact STMicroelectronics for custom FPC designs and/or ZIF connector variants

**Table 2. Optical specifications**

Parameter	Values
Lens	4-elements
F number	3.2
Horizontal 1/2 FOV (degrees)	25
Diagonal 1/2 FOV (degrees)	30
Optical distortion (negative preferred)	<  1.5%
TV distortion	<  1%
<b>MTF at 80 cy/mm</b>	
On-axis MTF	T and S > 55%
Horizontal field of view MTF	T>45% S>45%
Diagonal field of view MTF	T>35% S>35%

**Table 3. Temperature range**

Storage	-40 to +85 °C
Functional	-30 to +70 °C
Normal operating	-25 to +55 °C
Optimal operating	+5 to +30 °C

Figure 3. Outline drawing - Socket option

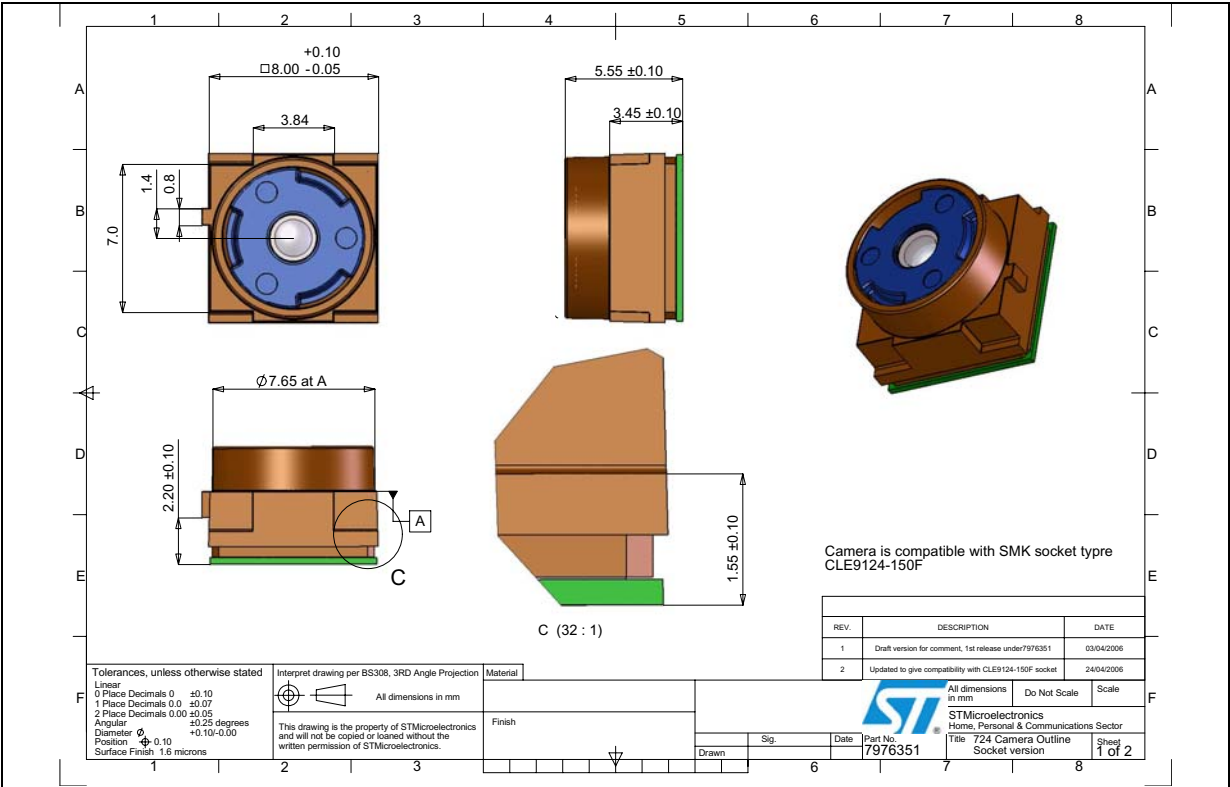


Figure 4. Outline drawing - Socket option

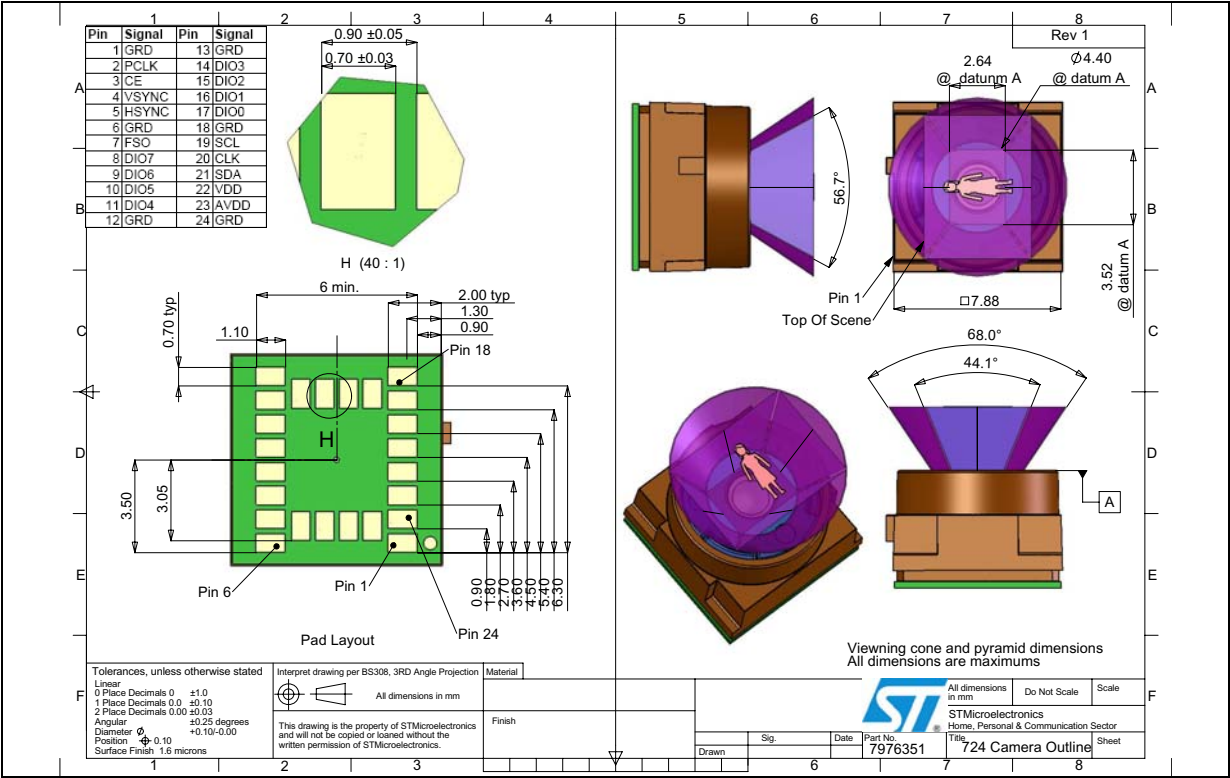


Figure 5. Outline drawing flex option

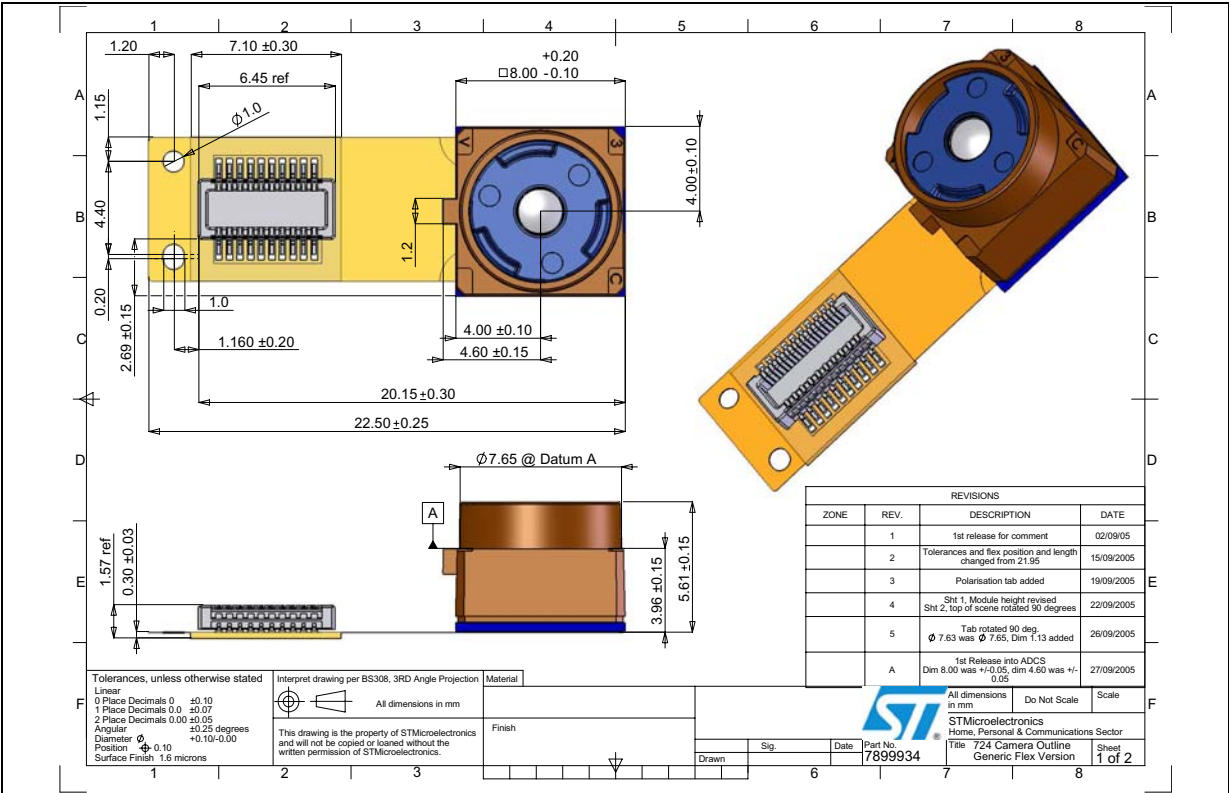
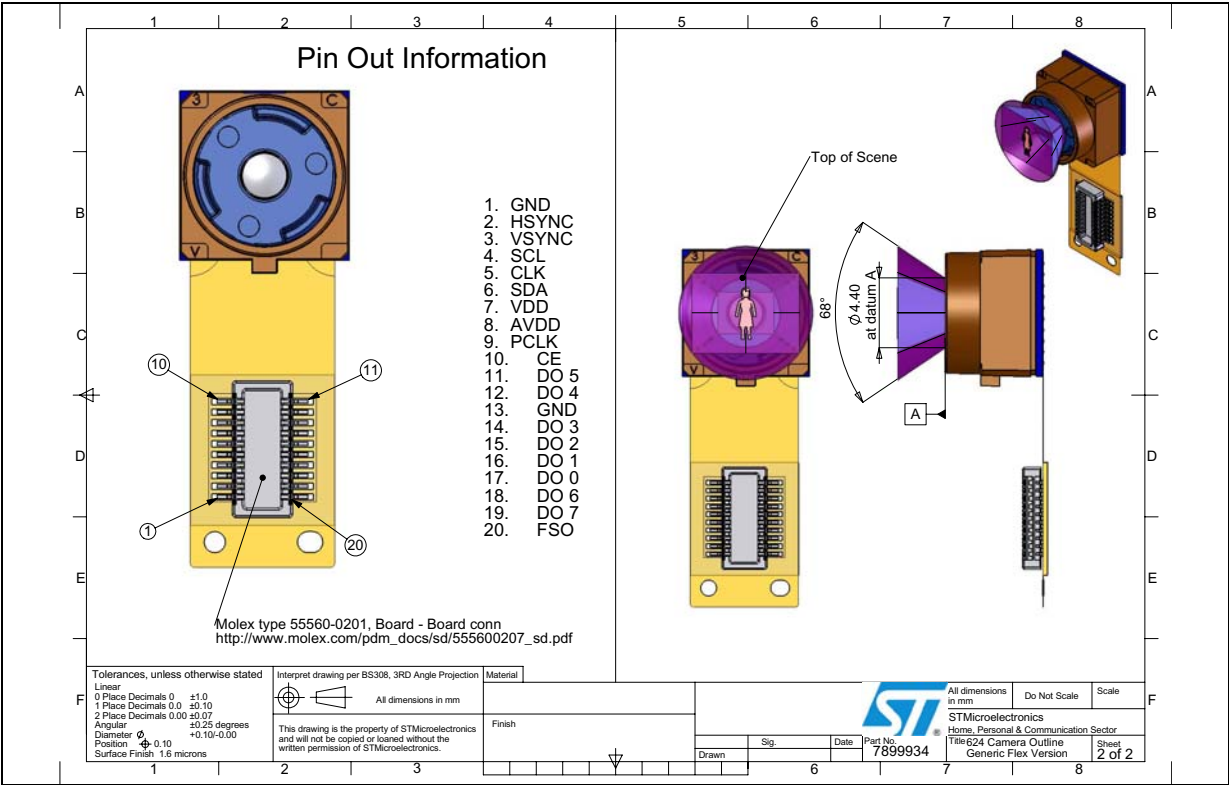


Figure 6. Outline drawing flex option



## Ordering information

**Table 4. Order codes**

Part number	Package	Packing
VS6724P0FY	SmOP2 8.0 x 8.0 x 5.5mm 20-wire FPC 22mm total length, head dimensions 8.0 x 8.0 x 5.61mm	FPC attach: tray packing
VS6724Q0FB	SmOP2 8.0 x 8.0 x 5.5mm	Socket attach: tape and reel

## Revision history

**Table 5. Document revision history**

Date	Revision	Changes
08-Jan-2007	1	Initial release.

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