0.3 Mega Pixels Serial JPEG Camera with NTSC Video

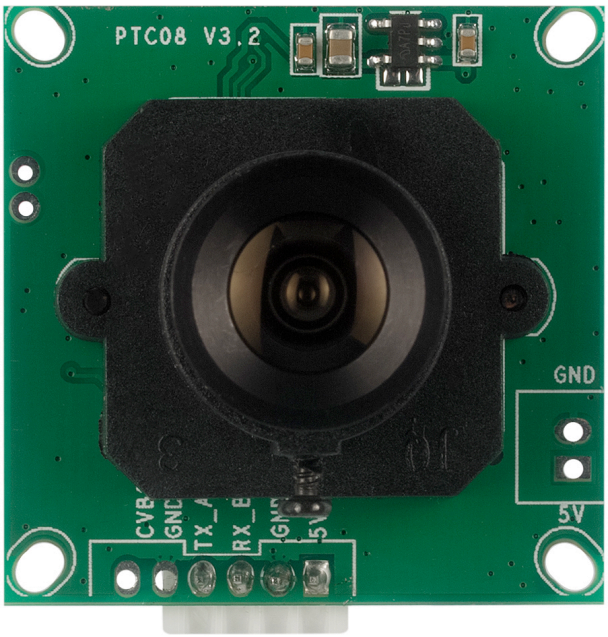
SC03MPD User Manual, Rev. D

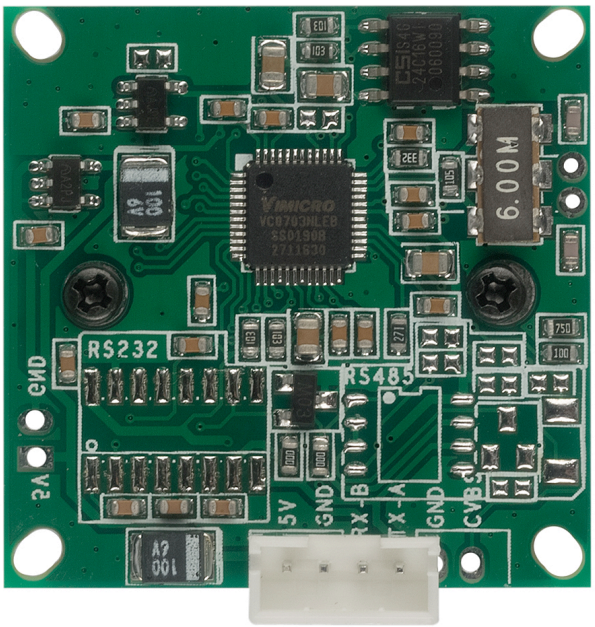
For latest user manual, please visit: www.jpegcamera.com

Introduction

The SC03MPD series camera is a 0.3 mega pixels JPEG color compression module that performs as a video camera or a JPEG compressed still camera and can be attached to a wireless or PDA host. Users can send out a snapshot command from the host in order to capture a full resolution single-frame still picture. The picture is then compressed by the JPEG engine and transferred to the host.

It outputs NTSC/PAL video and can take snapshots of that video (in color) and transmit them over the TTL serial link. You can snap pictures at 640x480, 320x240 or 160x120 and they're pre-compressed JPEG images which makes them nice and small and easy to store on an SD card. Perfect for a data-logging, security, or photography project.





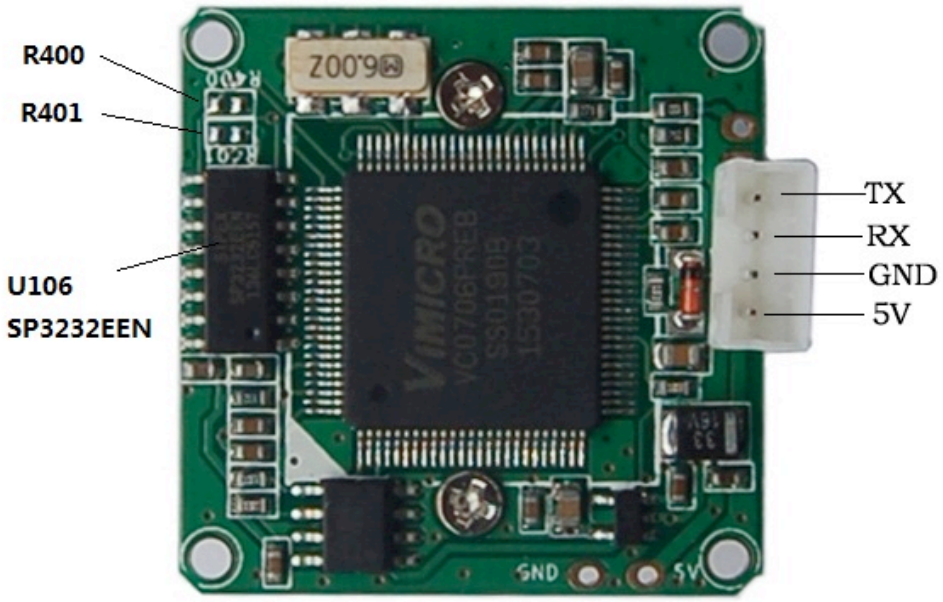
Features

- Module dimension: 32 x 32 x 28mm
- Image size: VGA（640*480), QVGA（320*240) (default), QQVGA（160*120）
- Low power consumption, 5V operation
- UART interface support up to 115200 bps, (default 38400bps)

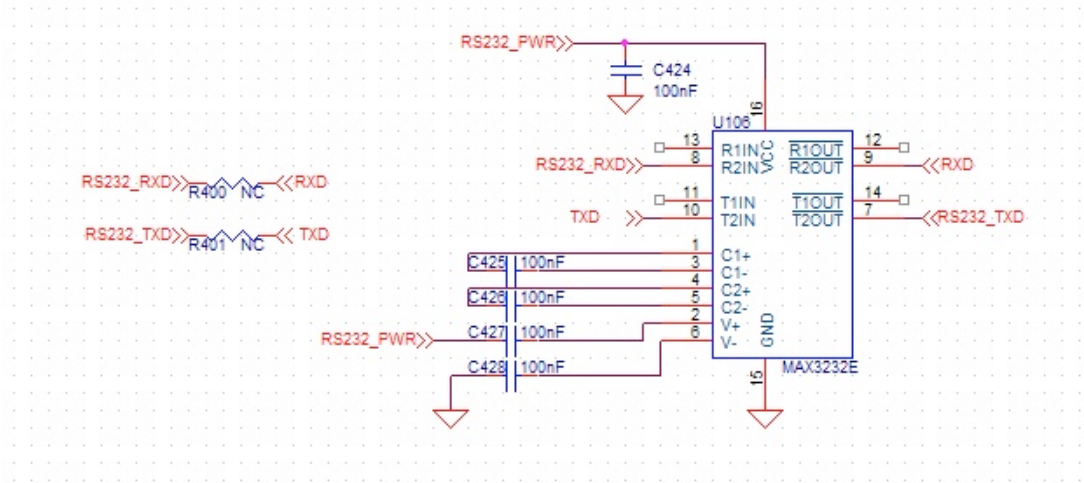
- Built-in JPEG CODEC
- Built-in lens, default 3.6mm lens, multi options
- VC0706 protocol

Pin Definition

Pin	Description
TX	Data Transmit (RS232/TTL level)
RX	Data Receive (RS232/TTL level)
GND	Power Ground
VCC	Power 5V DC



TX and RX are default as RS232 level as shown in the figure above, however if TTL is desired, it can be achieved as follow (not recommend) (TTL level can be also supplied without U106):
(1) Remove SP3232 IC (U106)
(2) Add 0 Ohm resistance in R400 and R401



Electrical Specification:

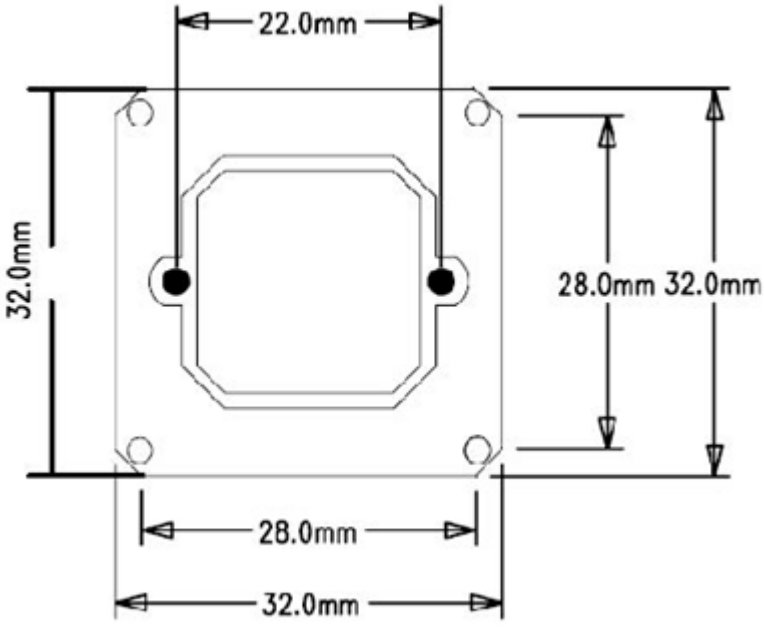
VDD = 3.3V+10%, TA = 0 to 25

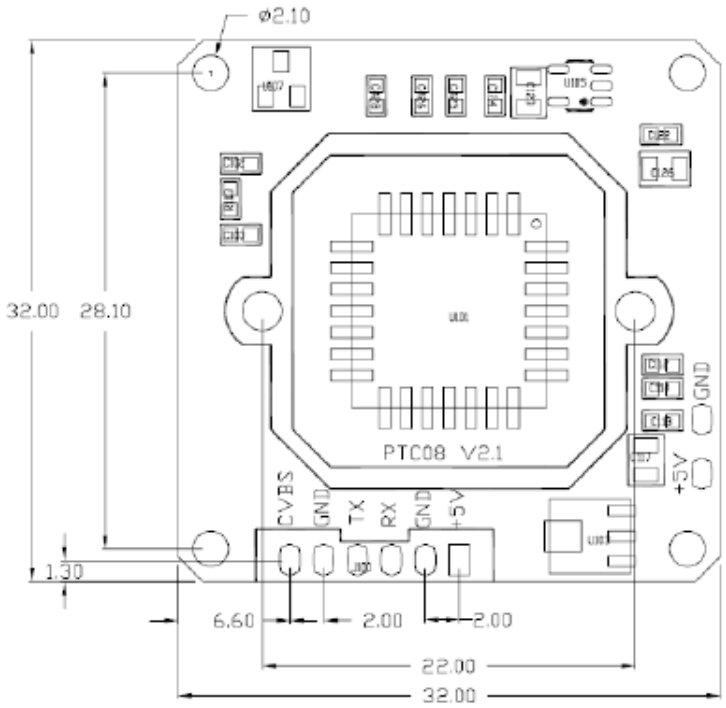
Parameter	Min	TVp	Max	Unit
DC supply voltage	3.3	5.0	6.0	V
Operation Current	60	70	85	mA
Operating temperature range	-20	20	85	℃

DSP and Lens Specification:

Description	Parameter
DSP	VC0706
Image Sensor	MT9V011
Imager Format	1/4"
F/#	2.0
Focal Length	3.6mm
Field of View Diagonal	90 degree
Distortion	0.38%
Relative Illumination	>53%

Mechanical Specification:





Command Protocol (HEX format data)

1. RESET：56 00 26 00　　RETURN：76 00 26 00

RESET
（56 00 26 00 ）

→

←

ACK
（76 00 26 00 ）

2. CAPTURE A IMAGE：56 00 36 01 00　　RETURN：76 00 36 00 00

CAPTURE
（56 00 36 01 00 ）

→

←

ACK
（ 76 00 36 00 00 ）

3. READ IMAGE DATA LENGTH：56 00 34 01 00

RETURN：76 00 34 00 04 00 00　XX　YY

XX　YY ------- image length， XX--- high byte，YY--- low byte

READ DATA LENGTH
（56 00 34 01 00 ）

→

←

ACK
（ 76 00 34 00 04 00 00 XX YY ）

4. READ IMAGE DATA：56 00 32 0C 00 0D 00 00 XX XX 00 00 YY YY 00 0A

RETURN：76 00 32 00 00 FF D8 。。。。。。FF D9 76 00 32 00 00

00 00 XX XX

---- start address（the address must be times of 8，for example **00 00** ）

00 00 YY YY ----the length of image data（high byte，low byte）

Note: JPEG IMAGE DATA must be **FF D8 in first**，and **FF D9 in end.**

READ DATA
（56 00 32 0C 00 0D 00 00 XX XX 00 00 YY YY 00 0A）

ACK
（76 00 32 00 00 FF D8 。。。。。。FF D9 76 00 32 00 00 ）

5. STOP CAPTURE：56 00 36 01 02 RETURN：76 00 36 00 00

STOP CAPTURE
（56 00 36 01 02）

ACK
（76 00 36 00 00）

6. SETTING IMAGE COMPRESSIBILITY：56 00 31 05 01 01 12 04 XX

RETURN：76 00 31 00 00

XX ----default value: 36 （range：00 ----FF）

SET COMPRESSIBILITY
（56 00 31 05 01 01 12 04 XX）

ACK
（76 00 31 00 00）

7. SETTING IMAGE RESOLUTION： （default：320 * 240）

56 00 31 05 04 01 00 19 11 （320*240） **RETURN：76 00 31 00 00**

56 00 31 05 04 01 00 19 00 （640*480）

56 00 31 05 04 01 00 19 22 （160*120）

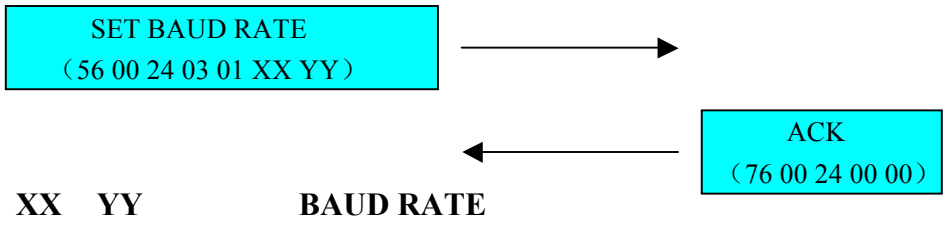
SET RESOLUTION
（56 00 31 05 04 01 00 19 XX）

ACK
（76 00 31 00 00）

Note: after setting the desired image size, you need to reset the camera first, and then the new setting would

be enabled.

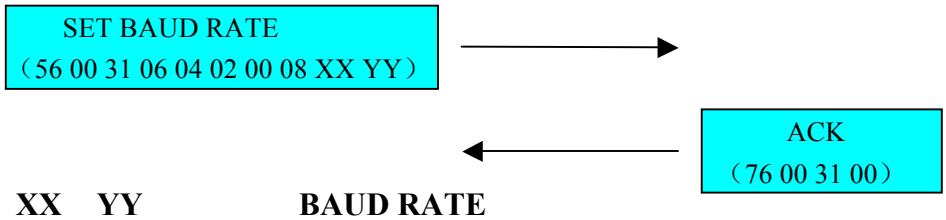
8. BAUD RATE: (default: **38400bps)**



XX	YY	BAUD RATE
AE	C8	9600
56	E4	19200
2A	F2	38400
1C	4C	57600
0D	A6	115200

Note: the baud rate will always go back to the default 38400bps after power off.

9. CHANGE DEFAULT BAUD RATE:



XX	YY	BAUD RATE
AE	C8	9600
56	E4	19200
2A	F2	38400
1C	4C	57600
0D	A6	115200

Note: After any change, please reset the camera to make the change valid.

10. MOTION DETECTION:

The motion detection function is default as disabled after each power off, if the motion detection is enabled, the camera then will alert the host if the camera detects a change in the objects in the view by sending out “76 00 39 00 00” to the host through serial link. The host can enable or disable the motion detection by issuing following commands:

To enable the motion detection function, send the command: **56 00 37 01 01**, receiving ACK: 76 00 37 00 00

To disable the motion detection function, send the command: **56 00 37 01 00**, receiving ACK: 76 00 37 00 00
If receiving ACK: 76 00 37 00 00: 76 00 37 03 00, wrong setting, please try it again.

How it works: when the camera detects a change, it will send out "76 00 39 00 00" to host through serial link, when the host receives such information, it is recommended to disable the motion detection first before image capturing (to prevent image data interference from motion detection), the motion detection can be enabled again after image capturing is complete for next capture.

10.1 SET MOTION DETECTION SENSITIVITY

The host can set the sensitivity of motion detection for the camera by issuing this command.
56 00 31 05 01 01 1A 6E XX
Receiving ACK command 76 00 31 00 00
XX represents the sensitivity of motion detection, ranges from 00 to FF.
If XX is 00, most sensitive, might alert wrong detection.
If XX is FF, least sensitive, might not be able to alert.
XX = 03 is recommended.
Therefore, the recommended procedures to use motion detection in the field would be:
Step 1: set right motion detection sensitivity by issuing command: 56 00 31 05 01 01 1A 6E 03
Step 2: enable motion detection by issuing command: 56 00 37 01 01

10.2 INQUIRE MOTION DETECTION STATUS

The host can inquire the motion detection status by issuing this command.
56 00 38 00
If receiving ACK command 76 00 38 00 01 00, the motion detection is disabled.
If receiving ACK command 76 00 38 00 01 01, the motion detection is enabled.

11. INITIAL OPERATION PROCESS:

（1）power up

（2）delay 2.5s

（3）reset command

（4）set image resolution command

（5）set image compressibility command

12. Capture one image operation process

（1）stop image capture command: 56 00 36 01 02 **Return:** 76 00 36 00 00

（2）capture the first image command: 56 00 36 01 00 **Return:** 76 00 36 00 00

（3）read the first image data length command: 56 00 34 01 00

Return: 76 00 34 00 04 00 00 XX YY

（4）read the first image data command: 56 00 32 0C 00 0A 00 00 XX XX 00 00 YY YY 00 FF

Return: 76 00 32 00 00 FF D8 。。。。。。FF D9 76 00 32 00 00

00 00 XX XX ---- start address(the address must be multiples of 8， first high byte, then low byte)

00 00 YY YY ----the length of image data（high byte，low byte）

13. Capture two images operation process

（1）power on and delay 2.5s

（2）capture the second image command: 56 00 36 01 01

Return: 76 00 34 00 04 00 00 XX YY

（3）stop image capture command: 56 00 36 01 02 **Return:** 76 00 36 00 00

Every stop image capture command will snap an image, performing twice will capture two images.

For example, performing “stop image capture command” the first time will snap the first image, after 1s (the delay is adjustable), performing the second time will snap the second image.

Note: Performing the third time 3 times will overwrite the first image, and performing the fourth time will overwrite the second image. It is two times cycle overwrite.

（4）read first image data length command: 56 00 34 01 00

Return: 76 00 34 00 04 00 00 XX YY

（5）read first image data command: 56 00 32 0C 00 0A 00 00 XX XX 00 00 YY YY 00 FF

Return: 76 00 32 00 00 FF D8 。。。。。。FF D9 76 00 32 00 00

00 00 XX XX ---- start address(the address must be multiples of 8， first high byte, then low byte)

00 00 YY YY ----the length of image data（high byte，low byte）

（6）read second image data length command 56 00 34 01 01

Return: 76 00 34 00 04 00 00 XX YY

XX YY ----the length of image data（high byte，low byte）

（7）read second image data command: 56 00 32 0C 01 0A 00 00 XX XX 00 00 YY YY 00 FF

Return: 76 00 32 00 00 FF D8 。。。。。。FF D9 76 00 32 00 00

00 00 XX XX ---- start address(the address must be multiples of 8， first high byte, then low byte)

00 00 YY YY ----the length of image data（high byte，low byte）

For questions regarding this user manual, please email to info@jpegcamera.com

Or Call +1(800) 837-5859. Thank you.